
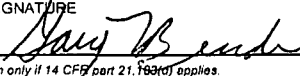
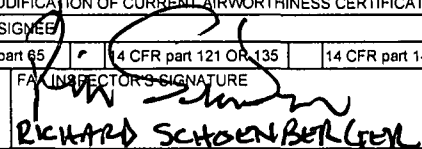


# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
12/31/2010

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																																																																																																																																																																																																					
		<b>I. AIRCRAFT DESIGNATION</b> 1. REGISTRATION MARK N8172V 5. AIRCRAFT SERIAL NO. AA001 8. NUMBER OF ENGINES One (1)		2. AIRCRAFT BUILDER'S NAME (Make) General Atomics, ASI 6. ENGINE BUILDER'S NAME (Make) Honeywell 9. PROPELLER BUILDER'S NAME (Make) McCauley		3. AIRCRAFT MODEL DESIGNATION UPB97010-I 7. ENGINE MODEL DESIGNATION TPE-331-10Y-511GA 10. PROPELLER MODEL DESIGNATION 3GFR36C606-B		4. YR. MFR. 2003 FAA CODING 11. AIRCRAFT IS (Check if applicable) IMPORT																																																																																																																																																																																																	
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C 6 MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)																																																																																																																																																																																																									
A. REGISTERED OWNER (As shown on certificate of aircraft registration) IF DEALER, CHECK HERE																																																																																																																																																																																																									
NAME General Atomics Aeronautical Systems, Inc.					ADDRESS 14200 Kirkham Way Poway, CA 92064																																																																																																																																																																																																				
B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																																																																																																																																																																																																									
AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.) N/A					AIRCRAFT CERTIFICATION BASIS (Check if all applicable AD's are compiled with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application) 2011-15																																																																																																																																																																																																				
AIRCRAFT LISTING (Give page number(s)) N/A					SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated) N/A																																																																																																																																																																																																				
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✓ CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417					TOTAL AIRFRAME HOURS 569.7		3 EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) 0																																																																																																																																																																																																		
D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																																																																																																																																																																																																									
DATE OF APPLICATION July 25, 2011			NAME AND TITLE (Print or type) Gary Bender, Director of Flight Operations Facilities				SIGNATURE 																																																																																																																																																																																																		
A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.193(a) applies.																																																																																																																																																																																																									
2		14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)		3		CERTIFICATED MECHANIC (Give Certificate No.)		6																																																																																																																																																																																																	
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(Check ALL applicable block items A and B)																																																																																																																																																																																																									
A. I find that the aircraft described in Section I or VII meets requirements for					THE CERTIFICATE REQUESTED 4 AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE																																																																																																																																																																																																				
B. Inspection for a special permit under Section VII was conducted by:					✓ FAA INSPECTOR CERTIFICATE HOLDER UNDER 14 CFR part 65 14 CFR part 121 OR 135 14 CFR part 145																																																																																																																																																																																																				
DATE July 25, 2011		MIDO/FSDO Office ANM-108L		4		DESIGNEE'S SIGNATURE AND NO.		1																																																																																																																																																																																																	
						FAA INSPECTOR'S SIGNATURE 																																																																																																																																																																																																			



<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER							
	NAME		ADDRESS					
	B. PRODUCTION BASIS <i>(Check applicable item)</i>							
	<input type="checkbox"/> PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> _____							
	<input type="checkbox"/> TYPE CERTIFICATE ONLY							
	<input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM							
C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS								
DATE OF APPLICATION		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE				
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	A. DESCRIPTION OF AIRCRAFT							
	REGISTERED OWNER		ADDRESS					
	BUILDER <i>(Make)</i>		MODEL					
	SERIAL NUMBER		REGISTRATION MARK					
	B. DESCRIPTION OF FLIGHT      CUSTOMER DEMONSTRATION FLIGHTS <input type="checkbox"/> <i>(Check if applicable)</i>							
	FROM		TO					
	VIA		DEPARTURE DATE	DURATION				
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT							
	<input type="checkbox"/>	PILOT	<input type="checkbox"/>	CO-PILOT	<input type="checkbox"/>	FLIGHT ENGINEER	<input type="checkbox"/>	OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:							
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>							
	F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.							
	DATE		NAME AND TITLE <i>(Print or Type)</i>			SIGNATURE		
<b>VIII. AIRWORTHINESS DOCUMENTATION <i>(FAADEESIONE use only)</i></b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.			G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>			I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section _____ CAR _____ <i>(Original Attached)</i>			
	<input checked="" type="checkbox"/>	D. Current Weight and Balance Information Available in Aircraft <u>GC5</u>			J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191(b)(2)(5)</u> <i>(Copy Attached)</i>			
	<input type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>			<input checked="" type="checkbox"/>	K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>		
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records						

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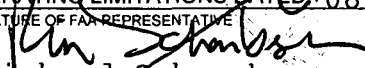
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UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

# **SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Dev/Market Surv/Crew Training</b>	
<b>B</b>	MANU-FACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics (ASI)</b>	MODEL <b>UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>08/12/10</b>	EXPIRY <b>08/11/11</b>
	OPERATING LIMITATIONS DATED <b>08/12/10</b>	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Richard Schoenberger</b>	DESIGNATION OR OFFICE NO.  <b>ANM-108L</b>

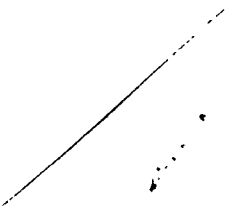
Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

<b>A</b>	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
<b>B</b>	This airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
<b>C</b>	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
<b>D</b>	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
<b>E</b>	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

OLD

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION	
SPECIAL AIRWORTHINESS CERTIFICATE	
<b>A</b>	CATEGORY/DESIGNATION <u>EXPERIMENTAL (UNMANNED AIRCRAFT)</u> PURPOSE <u>Research and Dev/Market Surv/Crew Training</u>
<b>B</b>	MANUFACTURER NAME <u>N/A</u> ADDRESS <u>N/A</u>
<b>C</b>	FLIGHT FROM <u>N/A</u> TO <u>N/A</u>
<b>D</b>	N- <u>8172V</u> SERIAL NO. <u>AA001</u> BUILDER <u>General Atomics (AST)</u> MODEL <u>UPB97010-1</u> DATE OF ISSUANCE <u>08/12/10</u> EXPIRY <u>08/11/11</u> OPERATING LIMITATIONS DATED <u>08/11/10</u> ARE PART OF THIS CERTIFICATE
<b>E</b>	SIGNATURE OF FAA REPRESENTATIVE <u>Richard Schoenberger</u> DESIGNATION OR OFFICE NO. <u>ANM-108L</u>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).





Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

**Operating Limitations**  
**Experimental: Research and Development, Market Survey,**  
**and/or Crew Training**

<b>REGISTERED OWNER NAME:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.	<b>AIRCRAFT BUILDER:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.
<b>REGISTERED OWNER ADDRESS:</b> 14200 KIRKHAM WAY POWAY, CA 92064	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT DESCRIPTION:</b> ALTAIR UNMANNED AIRCRAFT FIXED WING, TURBO PROP	<b>AIRCRAFT MODEL DESIGNATION:</b> ALTAIR UPB97010-1
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>ENGINE MODEL:</b> HONEYWELL TPE-331-10Y-511GA
<b>YEAR MANUFACTURED:</b> 2003	<b>PROPELLER MODEL:</b> MCCAULEY / 3GFR36C606-B

The following conditions and limitations apply to all flight operations for the General Atomics Aeronautical Systems, Inc., (GA-ASI) Altair unmanned aircraft system (UAS) while operating in the National Airspace System (NAS).

**1. General Information.**

**a. Integrated system.** For the purposes of this special airworthiness certificate and operating limitations, the Altair Unmanned Aircraft System (UAS) operated by GA-ASI is considered to be an integrated system. The system is composed of the following:

- 1) Altair unmanned aircraft, model UPB97010-1.
- 2) UAS control station(s), fixed, mobile, ground-based, or airborne.
- 3) Telemetry, launch, and recovery equipment.
- 4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Altair UAS.



5) Equipment on the ground and in the air used for communication with the chase aircraft, other members of the flight crew, observers, air traffic control (ATC), and other users of the NAS.

**b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules).** Unless otherwise specified in this document, the UA pilot-in-command (PIC) and GA-ASI must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

**c. Operational requirements.**

1) No person may operate this UAS for other than the purpose of research and development, market survey, and/or crew training, to accomplish the flight operation outlined in GA-ASI Altair Program Letter dated 07/06/2011, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

**d. UA condition.** The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

**e. Multiple-purpose operations.** When changing between operating purposes of a multiple purpose certificate, GA-ASI must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

**f. Operation exceptions.** No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

**g. UA markings.**

1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division, AIR-200.

2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

**h. Required documentation.** Prior to conducting the initial flight operations, GA-ASI must forward a scanned electronic copy of the Program Letter, and signed copies of the Special Airworthiness Certificate, and Operating Limitations to the following persons by email:

1) FAA Western Terminal Service Area, Mark Dillon, Unmanned Aircraft Systems, Air Traffic Control Specialist, Operations Support Group-NISC contractor, ATO, Western Service Center, Operations Support Group, AJV-W23, [mark.ctr.dillon@faa.gov](mailto:mark.ctr.dillon@faa.gov), telephone (425) 203-4522.





2) Tom Rampulla, Transportation Industry Analyst, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, (202) 385-6684, email: [thomas.rampulla@faa.gov](mailto:thomas.rampulla@faa.gov).

i. **Change in registrant address.** Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

j. **Certificate display and manual availability.** The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, General Rulemaking Procedures, to GA-ASI.

2. **Program Letter.** The Altair Program Letter, dated 07/06/2011, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

### 3. Authorized Flight Operations.

a. **General.** The flight operations area authorized for the Altair UA will be referred to as the Primary Containment Area (PCA) and is depicted graphically below in blue. Flight operations in the PCA shall be conducted within the defined boundaries at or below 13,000 ft MSL. Flight operations above 13,000 ft MSL are not authorized. When operating in a terminal environment, the UA must have line of sight communications. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. All operations will be conducted in accordance with the FAA accepted GA-ASI Flight Operations Procedures, ASI-00009 (Civil), and GA-ASI Ground Operations Procedures, ASI-00056 (Civil).

1) VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in.

2) Special VFR is not authorized.

b. **Description of the authorized flight operations area and flight-testing.** The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA. Altair flights are authorized in the PCA and the Edwards ranges. Fuel shall be limited to that necessary to complete the intended mission plus 250 pounds.



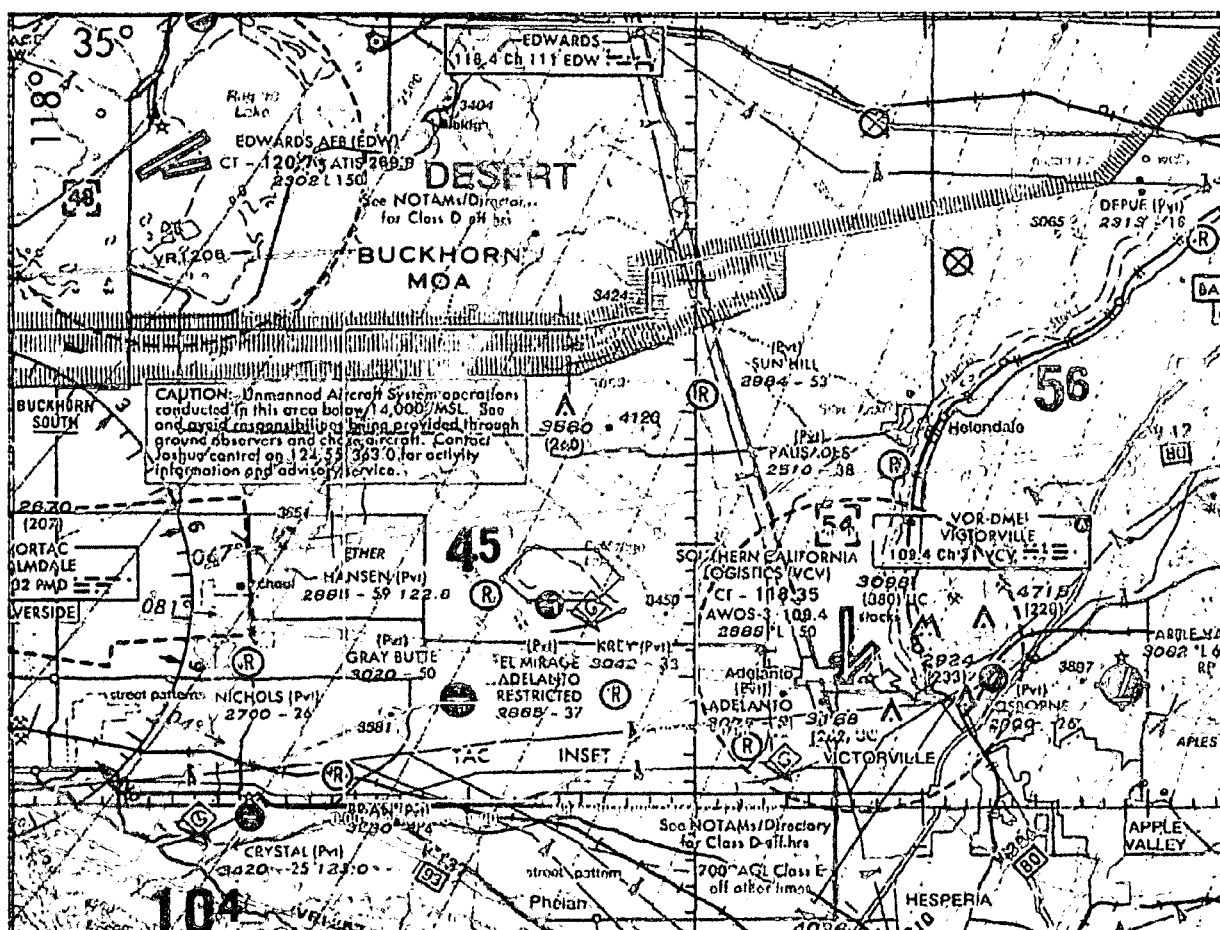


Figure 1: Primary Containment Area

Figure 1 Local Ops Area - BLUE

SW	N34°30'00"	W 117°45'30"
NW	N34°48'00"	W 117°45'30"
N1	N34°48'00"	W 117°35'03"
N2	N34°48'30"	W 117°32'03"
N3	N34°50'15"	W 117°32'03"
NE	N34°53'20"	W 117°11'53"
E1	N34°39'30"	W 117°30'00"
SE1	N34°34'00"	W 117°30'00"
SE2	N34°30'00"	W 117°37'00"



Figure 1 Lost Link Orbit Points

**El Mirage (99CL) Airport – RED  
North Emergency Mission Altair**

Waypoints	Approved Orbit Altitudes			
1 N34 38 32 W 117 38 39	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
2 N34 39 36 W 117 37 25	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
3 N34 39 35 W 117 34 29	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
4 N34 38 32 W 117 33 20	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
5 N34 37 38 W 117 34 25	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
6 N34 37 39 W 117 37 28	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL

**Gray Butte Field (04CA) Airport – YELLOW  
South Emergency Mission Altair**

Waypoints	Approved Orbit Altitudes			
1 N34 32 43 W 117 43 24	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
2 N34 33 43 W 117 42 23	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
3 N34 33 44 W 117 39 16	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
4 N34 32 45 W 117 38 07	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
5 N34 31 45 W 117 39 21	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
6 N34 31 45 W 117 42 13	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL

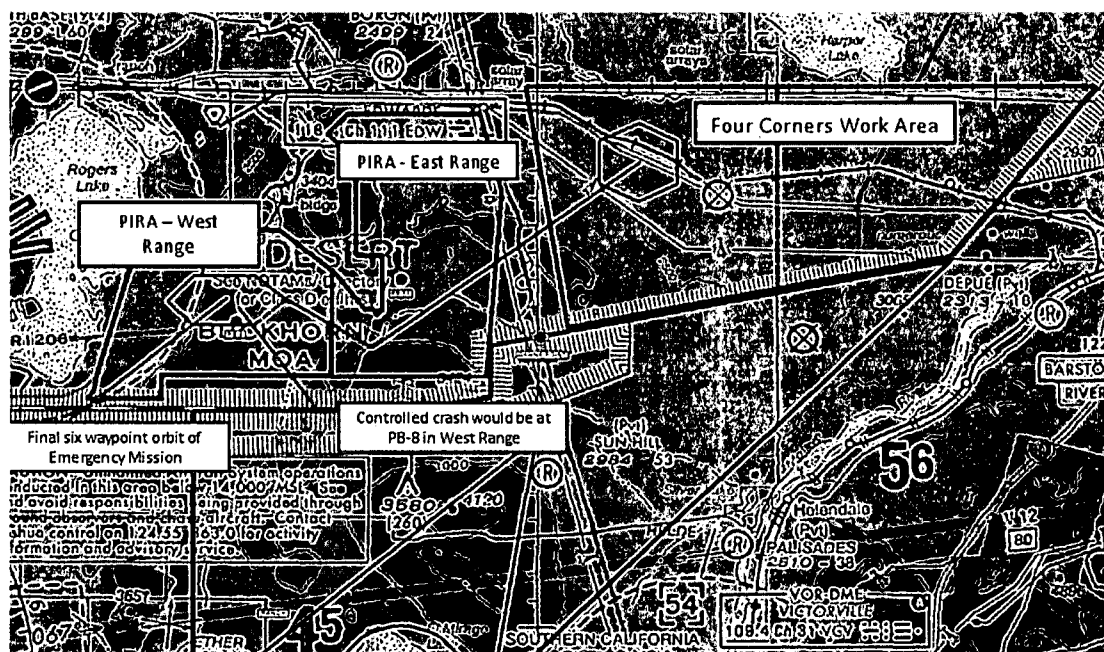


Figure 2. PIRA West Range and Four corners Work Area

**d. Authorized flight times and conditions.** All flight operations must be conducted during daylight hours under visual flight rules (VFR). It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the



using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g., spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the PCA. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

**e. Criteria for remaining in the flight test area.** The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the PCA. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

**f. Incident/accident reporting.** Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AFS-407. AFS-407 can be reached by telephone at 202-385-4636 and fax at 202-385-4651. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations must not be conducted until the incident is reviewed by AFS-407 and authorization to resume operations is provided to GA-ASI.

#### **4. UA Pilots and Observers.**

##### **a. UA PIC roles and responsibilities.**

1) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.

2) The UA PIC must perform crew duties for only one UA at a time.

3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground. UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.

4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

##### **b. UA PIC certification and ratings requirements.**

1) UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.

##### **c. UA PIC currency, flight review, and training.**

1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.





2) The UA PIC must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

3) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

4) All UA PICs must have successfully completed applicable GA-ASI company training for the UAS.

5) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**d. Supplemental UA pilot roles and responsibilities.**

1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.

2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.

3) A supplemental UA pilot must perform crew duties for only one UA at a time.

**e. Supplemental UA pilot certification.** Any supplemental pilot shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

**f. Supplemental UA pilot currency, flight review, and training.**

1) All UA pilots must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

3) All UA pilots must have successfully completed applicable GA-ASI training for the UAS.

4) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**g. Observer roles and responsibilities.** The task of the observer is to provide the UA PIC with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

1) The observer must perform crew duties for only one UA at a time.

2) The UA must remain within a lateral distance of no more than 2.5 NM and 3,000 feet vertically from the visual observer. This is to ensure maneuvering information can be reliably determined.



3) An observer must maintain visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.

4) For the purpose of see-and-avoid, visual observers must be utilized at all times. The observers may either be ground based or in a chase plane. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

5) Observers must continually scan the airspace for other aircraft that pose a potential conflict.

6) In order to comply with the see and avoid requirements of Title 14 Code of Federal Regulations §§ 91.113 and 91.111, the pilot-in-command and visual observers must be able to see the aircraft and the surrounding airspace throughout the entire flight; and be able to determine the aircraft's altitude, flight path and proximity to traffic and other hazards (terrain, weather, structures) sufficiently to exercise effective control of the aircraft to give right-of-way to other aircraft, and to prevent the aircraft from creating a collision hazard.

#### **h. Observer certification.**

1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.

2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

#### **i. Observer training.**

1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.

2) All observers must have successfully completed applicable GA-ASI training for the UAS.

**j. Training and currency records.** The training and currency requirements for pilots and observers listed in this section must be documented by GA-ASI in the individual pilot/observers personnel records and made available for inspection upon request by the FAA.



## 5. **Equipage.**

a. The UAS shall be equipped with an operable Mode C or Mode S transponder and two-way communications equipment allowing communications between the UA pilot, chase aircraft, observers, all UAS control stations, and Air Traffic Control.

b. The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights.

**6. Electronic Devices.** The use of personal electronic devices (including cell phones) by crew members, other than for UA flight and mission requirements usage is prohibited.

## 7. **Communications.**

### a. **Before UA flights.**

1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.

**2) Prior to flight, the UAS flight operations schedule for N8172V must be provided to Mr. Cotry Shearill, at email [cotry.shearill@faa.gov](mailto:cotry.shearill@faa.gov), at the Van Nuys FSDO.**

### b. **During UA flights.**

1) Upon initial contact with ATC, the PIC must indicate the experimental nature of the aircraft in accordance with 14 CFR § 91.319.

2) The UA PIC must maintain two-way radio communication with ATC. In addition, if a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way radio communication with the UA PIC and an active listening watch on the assigned ATC frequency. Should the UAS experience communication difficulty or failure, the chase aircraft will assume responsibility for two-way radio communication with ATC for the flight. ***The UAS shall remain within 2.5 nm and 1500' AGL of the El Mirage or Gray Butte airport when conducting local traffic pattern operations and shall remain within the specified observer distances. While in the traffic pattern direct two-way radio communications with ATC are not required.***

3) The PIC and observer(s) must maintain two-way communications with each other during all operations.

4) If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the PCA, and conclude the flight operation.

5) If the chase aircraft is operating more than 100 ft above/below and or ½ nm laterally, of the UA, the chase aircraft PIC will advise the controlling ATC facility. The distances listed are the maximum; at no time will the UA be operated at a distance beyond the visual line of sight for the visual observer.

6) The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.

7) The PIC shall comply with all ATC instructions and/or clearances.



## 8. Flight Conditions.

**a. Daylight operations.** All flight operations must be conducted between official sunrise and sunset in visual meteorological conditions (VMC), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

**b.** General Atomics shall fax High Desert TRACON a daily squawk code request sheet to 661-258-4850 for local operations that will remain below 13,000' or that will operate in the R-2508 Complex. The daily squawk request shall be received by TRACON at least one hour prior to the first scheduled flight from either El Mirage or Grey Butte airport. If TRACON cannot accept the coordinated information, TRACON shall contact the appropriate user. The beacon code assignments are:

Call Sign Det 3	Transponder Code	Call Sign GA-ASI	Transponder Code
VEGAS01	5201	UAV11/DISCO11	5211
VEGAS02	5202	UAV12/DISCO12	5212
VEGAS03	5203	UAV13/DISCO13	5213
VEGAS04	5204	UAV14/DISCO14	5214
VEGAS05	5205	UAV15/DISCO15	5215
VEGAS06	5206	UAV16/DISCO16	5216
VEGAS07	5207	UAV17/DISCO17	5217

### c. Prohibitions.

1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA attitude, an abnormal acceleration, or other flight action not necessary for normal flight. (See § 91.303.)

2) The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) is prohibited.

3) The UA may not be operated by more than one control station at a time, and the control station may not be used to operate multiple UA.

4) The UA PIC shall not accept any ATC clearance requiring the use of visual separation, sequencing or visual approach.

5) Flight in Reduced Vertical Separation Minima (RVSM) airspace is not authorized.

6) The UA shall not be operated (including lost link procedures) over congested areas, heavily trafficked roads, or an open-air assembly of persons.

7) Operations shall not loiter on Victor airways, Jet Routes, Q Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.

8) Operations shall be conducted under VFR rules only and shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159). IFR operations are not authorized.

9) All operators that use GPS as a sole source, must check all NOTAM's and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited.





(10) At no time will TCAS be used in any mode while operating an unmanned aircraft.

**d. Transponder requirements.**

1) The UA must operate an altitude encoding transponder, Mode C or Mode S, in accordance with applicable guidelines and procedures.

2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA unless otherwise directed by ATC.

**e. Transponder failure.**

1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

**9. Flight Termination and Lost Link Procedures.**

**a. Flight termination.** Flight operations must be discontinued at any point that operation within the approved flight area(s) is breached or the UA can no longer be operated in a safe manner.

**b. Lost link procedures.** In the event of a lost link, the UAS pilot squawk 7600 and will immediately notify High Desert TRACON (E10) at (661) 277-3843, state pilot intentions, and comply with the following provisions:

1) If the UA is operating between the R-2508 Complex and El Mirage or Gray Butte Flight Test Facilities, the UA will remain within the approved local operations airspace, and fly back to the departure airfield (either El Mirage or Gray Butte), and orbit within 2.5 NM for the Altair.

2) Once established in the lost link orbit pattern around either El Mirage or Gray Butte Flight Test Facilities, when command link can be restored, recovery of the aircraft will occur unless mission continuation is authorized by ATC.

3) If lost link occurs while operating within restricted area R-2508, the UAS will fly the flight plan route to the established lost link area within the R-2508 restricted airspace (either in PIRA West or Four Corners Work Area, see Figure 2). Once established in the lost link pattern, when command link can be restored, recovery of the aircraft will occur unless mission continuation is authorized by ATC.

4) An aircraft that enters lost link in the Edwards range would initially hold in a loiter as indicated in the western half of the Four Corners work area. After generally 30 minutes it would proceed along the Emergency Mission ultimately orbiting in the West Range until C2 link with the aircraft was recovered or the aircraft ran out of gas. The aircraft would continue to fly the ground track of the final orbit until impacting the ground.

5) In the event of an in-flight emergency that was deemed too risky to return to Gray Butte or El Mirage, an attempt to land on the dry lake bed could be made. If a controlled crash were required it would be accomplished at PB-8 on the West Range.



c. The software for the aircraft lost link timer shall be set to 3 hours. If aircraft control cannot be re-established within 3 hours, the aircraft shall execute a controlled descent to the ground.

#### **10. Maintenance and Inspection.**

a. **General requirements.** The UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Inspection and Maintenance Program, ASI-01909-WC2, dated 25 June 2007, and ASI-00992 for the GCS, dated 1 August 2005, or later FAA approved revision. GA-ASI must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. **Inspections.** No person may operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed according to the FAA approved General Atomics Inspection and Maintenance Program, ASI-01909-WC2, dated 25 June 2007, and ASI-00992 for the GCS, dated 1 August 2005, or later FAA approved revision. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 10(d) below.

c. **Authorized inspectors.** Only those individuals trained and authorized by GA-ASI and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

d. **Maintenance and inspection records.** Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:

1) Maintenance record entries must include a description of the work performed, the date of completion for the work, the UAS total time-in-service, and the name, signature, and certificate number of the person accepting the work performed.

2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the GA-ASI Inspection and Maintenance Program, and was found to be in a condition for safe operation.*

3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of the General Atomics Inspection and Maintenance Program, ASI-01909-WC2, dated 25 June 2007, and ASI-00992 for the GCS, dated 1 August 2005, or later FAA approved revision. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

**11. Information Reporting.** General Atomics shall provide the following information to [donald.e.grampp@faa.gov](mailto:donald.e.grampp@faa.gov) on a monthly basis.

a. Number of flights conducted under this certificate.

b. Pilot duty time per flight.



- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

## **12. Revisions and Other Provisions.**

**a. Experimental certificates, program letters, and operating limitations.** The experimental certificate, FAA-accepted GA-ASI program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles Manufacturing Inspection District Office (LA MIDO), in coordination with AIR-200. AIR-200 will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

**b. Certificates of waiver or authorization.** GA-ASI shall immediately notify the Production and Airworthiness Division, AIR-200, and the LA MIDO, if there is any plan for requesting a Certificate of Authorization or Waiver (COA) for UAS operations during the time the experimental certificate is in effect. An entry in the aircraft logbook is required to document that the aircraft flight authority has been changed from the experimental certificate to COA. When COA operations are concluded and the aircraft resumes flying under the experimental certificate, a record entry will be made in the aircraft logbook by an appropriately rated person to document that the aircraft is in a condition for safe operation and appropriately configured.

**c. Amendments and cancellations.** The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

**d. Reviews of revisions.** All revisions to GA-ASI FAA-approved Maintenance and Inspection Program must be reviewed and approved by the Van Nuys Flight Standards District Office.

## **13. UAS Modifications.**

**a. Software and system changes.** All software and system modifications will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system modifications must be inspected and approved in accordance with the General Atomics Inspection and Maintenance Program, ASI-01909-WC2, dated 25 June 2007, and ASI-00992 for the GCS dated 1 August 2005, or later FAA approved revision. All software modifications to the aircraft and control station are categorized as major modifications, and must be provided in summary form at the time they are incorporated.

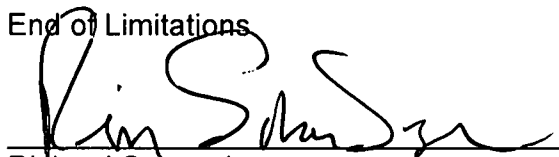
**b. Major modifications.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorizations must be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

**c. Submission of modifications.** All information requested must be provided to AIR-200.



07/25/2011

End of Limitations

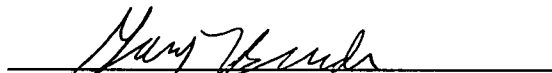


Richard Schoenberger  
Aviation Safety Inspector (Mfg)  
Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

7/25/2011  
Date

**I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 07/25/2011 for the purposes of research and development, market survey, and/or crew training.**

**This special airworthiness certificate is issued for the Altair model UPB97010-1 UAS, serial number AA001, registration number N8172V.**



Applicant (signature)  
Gary Bender  
Director, Flight Operations  
General Atomics, Aeronautical Systems Incorporated

7/25/11  
DateName







# GENERAL ATOMICS AERONAUTICAL

## AIRCRAFT MAINTENANCE RECORD

AIRCRAFT/EQUIPMENT S/N	FLIGHT #	ORIGINATOR	DISC	DATE	NCR #	FDR #
N8172V		T. SELBY		25 JUL 2011		

### DISCREPANCY:

THE UAS REQUIRES AN FAA AIRWORTHINESS INSPECTION WITH REGARDS TO THE APPLICATION FOR SPECIAL AIRWORTHINESS CERTIFICATE EXPERIMENTAL FOR R&D / CREW TRAINING / MARKET SURVEY DATED 25 JULY 2011

### CORRECTIVE ACTION: CAMS SCREEN 122 TAG NUMBER IS THE AFTO 350 TAG NUMBER:

I find this UAS meets the requirements for the certification requested and have issued a Special Airworthiness Certificate Dated: 07/25/2011. The operation of this UAS is contingent upon GA-ASI compliance with Program Letter Dated: 07/06/2011 and the applicable Operating Limitations for this UAS Dated: 07/25/2011. A new Condition Inspection is required prior to issuance of another Special Airworthiness Certificate.

*Ken Selby*

*RICHARD SCHOENBERGER*  
ASI FAA LA-MIDO

### PARTS REMOVED

	PART NUMBER	REV	SERIAL NUMBER	NOMENCLATURE	SERIAL TRACK #	HOURS/CYCLES
A						
B						
C						
D						
E						

	PART NUMBER
A	
B	
C	
D	
E	

AVIONICS HOBBS  
PRE / POST

/



CORRECTED BY

WORK ORDER #
SERIAL NUMBER
218077

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION SPECIAL AIRWORTHINESS CERTIFICATE			
A	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>		
	PURPOSE <b>Research &amp; Development / Market Survey / Crew Training</b>		
B	MANU-FACTURER	NAME	N/A
		ADDRESS	N/A
C	FLIGHT	FROM	N/A
		TO	N/A
D	N- 8172V		SERIAL NO. AA001
	BUILDER General Atomic ASI		MODEL UPB97010-1
	DATE OF ISSUANCE 07/25/2011		EXPIRY 07/24/2012
E	OPERATING LIMITATIONS DATED 07/25/2011		ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE <i>Richard Schoenberger</i>		DESIGNATION OR OFFICE NO. ANM-108L

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

FAA Form 8130-7 (07/04) SEE REVERSE SIDE NSN: 0052-00-693-4000

PROJECT NUMBER		
SYSTEM/REASON		
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# **PROGRAM LETTER**

for

General Atomics Aeronautical Systems, Inc. (GA-ASI)

## **Altair Special Airworthiness Certificate (Experimental)**

Date: 6 July 2011

REPORT NUMBER: DP08-200-001

TITLE: Program Letter for Altair Special Airworthiness Certificate

PROGRAM: Altair Experimental Recertification

10-10-10

REPORT NUMBER: DP08-200-001

TITLE: Program Letter for Altair Special Airworthiness Certificate

PROGRAM: Altair Experimental Recertification

Approved by: /signed/



W.L. Cone  
Program Manager

#### REVISION LOG

Rev Letter	Date	Revised By	Approved By	Pages Affected	Removed	Added	Remarks
NC	05/11/05	-		-	-	-	Initial Release
A	08/09/05	R. Blair	R.S. Dann	All			Incorporate FAA comments
B	08/18/05	R. Blair	R.S. Dann	3			Ref Altair Maintenance and Inspection Program
C	08/23/05	R.S. Dann	R.S. Dann	All			Incorporated FAA comments
D	06/05/06	M. Cooper	R.S. Dann	All			Incorporated FAA comments
E	06/05/07	M. Cooper	R.S. Dann	All			Updated
F	08/13/07	M. Cooper	R.S. Dann	Pg 3, 3.3 Pg 5, 5.2c	Night Ops request	Distance around Oparea	Incorporated changes
G	08/30/08		S.B Richardson	All			Updated per 8130.34
H	01/05/09	S.B.Richardson	S.B.Richardson	4, 5		New OPAREA	Updated OPAREA per FAA Nov 08
I	07/29/09	S.B.Richardson	S.B.Richardson	3			Updated address And specified Propeller model
J	07/29/10	W.L. Cone	W.L. Cone				Updated
K	07/06/11	W.L. Cone	W.L. Cone				Updated ATC procedures per FAA

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**GA-ASI PROGRAM LETTER FOR ALTAIR UNMANNED AIRCRAFT SYSTEM  
(UAS), SPECIAL AIRWORTHINESS CERTIFICATE**

<b>REGISTERED OWNER NAME:</b> General Atomics Aeronautical Systems Inc.	<b>AIRCRAFT BUILDER:</b> General Atomics Aeronautical Systems Inc.
<b>REGISTERED OWNER ADDRESS:</b> 14200 Kirkham Way Poway, CA 92064	<b>YEAR MANUFACTURED:</b> 2003
<b>AIRCRAFT DESCRIPTION:</b> Altair Unmanned Aircraft	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>AIRCRAFT MODEL DESIGNATION:</b> Altair – UPB 97010-1
	<b>ENGINE MODEL:</b> Honeywell TPE331-10Y-511GA
	<b>PROPELLER MODEL:</b> McCauley/3GFR36C606-B

**1. DEFINE THE EXPERIMENTAL PURPOSE(S) UNDER WHICH THE  
AIRCRAFT IS TO BE OPERATED (14 CFR § 21.191):**

1.1 General Atomics Aeronautical Systems Inc. (GA-ASI) requests an Experimental Certificate to conduct flight operations under (14 CFR § 21.191(a) & (c)) of our Altair Unmanned Aircraft System (UAS) at our Gray Butte and El Mirage Flight Operation Facilities for the following purposes:

1.1.1 Research and Development - Testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft.

1.1.2 Crew Training - Training of our flight crews.

1.1.3 Market Survey – Use the aircraft to conduct marketing surveys or sales demonstrations.

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**2. DESCRIBE THE PURPOSE / SCOPE OF THE EXPERIMENTAL PROGRAM FOR EACH 14 CFR § 21.191 EXPERIMENTAL PURPOSE SOUGHT (14 CFR §§ 21.193(b)(d))**

2.1 GA-ASI requests an experimental certificate for Altair for operating the UAS at our Flight Operations Facilities for the following purposes:

2.1.1 Company Research and Development Flights – The Altair UAS system will be used for continued verification of the system performance envelope, and to test / verify enhancements and upgrades proposed for the system.

2.1.2 Crew training – GA-ASI desires to employ Altair for crew training of company personnel.

2.1.3 Market Surveys – GA-ASI may demonstrate Altair capability to various potential customers.

2.2 Detailed information required by 14 CFR § 21.193 (b) & (d) is provided in the following paragraphs.

**3. DEFINE THE AREA(S) IN WHICH THE EXPERIMENTAL FLIGHTS WILL BE CONDUCTED:**

3.1 Address of Base of Operation: Operations will be conducted from the GA-ASI flight operations facilities located at Gray Butte and El Mirage, CA.

3.1.1 Gray Butte Flight Test Facility  
25500 East Avenue R-8  
Palmdale, CA 93550  
(661) 233-6000

3.1.2 El Mirage Flight Test Facility  
73 El Mirage Airport Road – Suite B  
Adelanto, CA 92301  
(760) 388-8100

3.2 Special Provisions - Altair will be operated in accordance with the special provisions specified below.

3.2.1 Altair operations will be conducted in Visual Meteorological Conditions (VMC). Altair shall follow FAR Part 91 cloud clearance requirements.

3.2.2 Flight operations will not be conducted in the Victorville (KVCV) Class D airspace.

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3.2.3 Altair UAS flight operations will be conducted in accordance with Visual Flight Rules (VFR) and with an appropriately equipped chase aircraft below 13,000 feet MSL in the following Primary Containment area and within the noted coordinates in Table 1 and is depicted in Figure 1. Figure 2 depicts emergency mission orbit locations when operating in the PIRA West Range and Four Corners Work Areas within the R-2508 complex.

SW	N34°30'00"	W 117°45'30"
NW	N34°48'00"	W 117°45'30"
N1	N34°48'00"	W 117°35'03"
N2	N34°48'30"	W 117°32'03"
N3	N34°50'15"	W 117°32'03"
NE	N34°53'20"	W 117°11'53"
E1	N34°39'00"	W 117°30'00"
SE1	N34°34'00"	W 117°30'00"
SE2	N34°30'00"	W 117°37'00"

Table 1: Primary Containment Area Coordinates

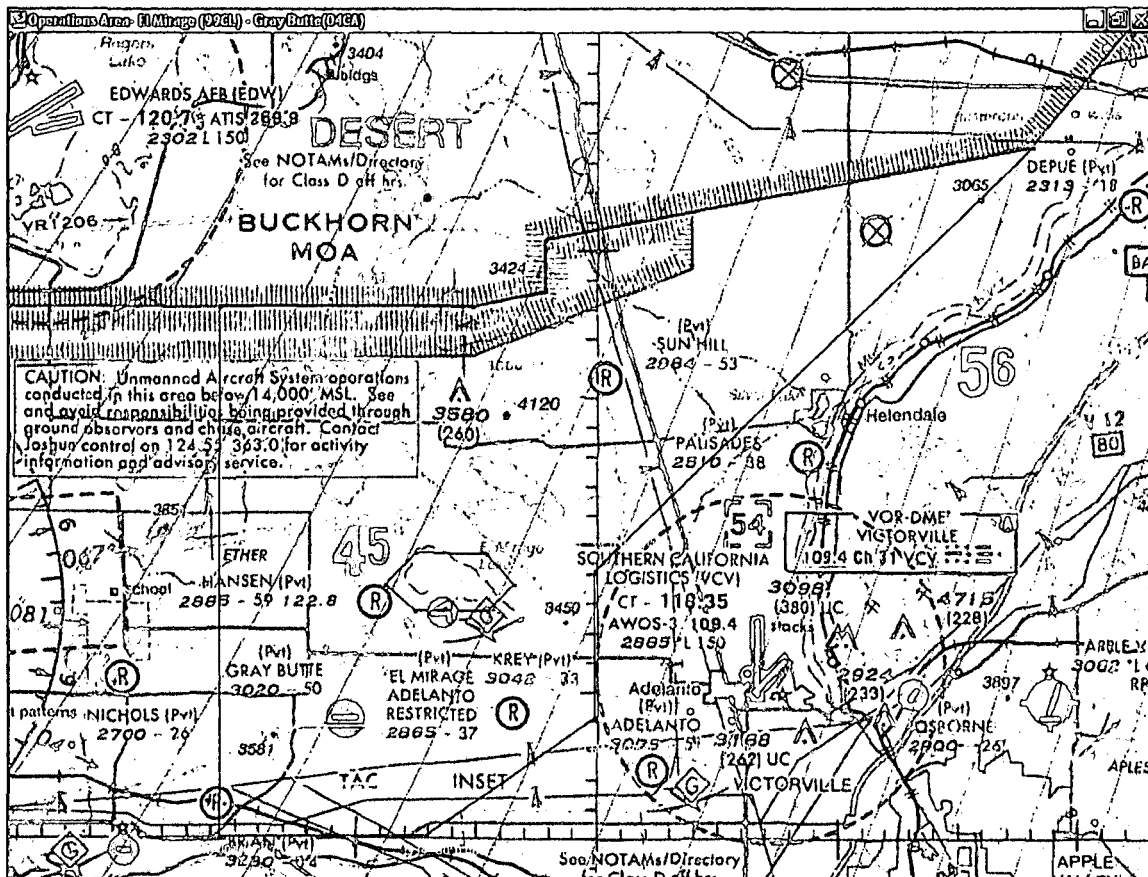


Figure 1: Primary Containment Area (WAC Depiction)

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## **Lost Link Orbit Points**

### **EI Mirage (99CL) Airport**

#### **North Emergency Mission MQ-9**

##### **Waypoints Altitude**

- 1 N34 38 32 W 117 38 39 5,500 MSL
- 2 N34 39 36 W 117 37 25 5,500 MSL
- 3 N34 39 35 W 117 34 29 5,500 MSL
- 4 N34 38 32 W 117 33 20 5,500 MSL
- 5 N34 37 38 W 117 34 25 5,500 MSL
- 6 N34 37 39 W 117 37 28 5,500 MSL

#### **North High Emergency Mission MQ-9**

##### **Waypoints Altitude**

- 1 N34 38 32 W 117 38 39 6,500 MSL
- 2 N34 39 36 W 117 37 25 6,500 MSL
- 3 N34 39 35 W 117 34 29 6,500 MSL
- 4 N34 38 32 W 117 33 20 6,500 MSL
- 5 N34 37 38 W 117 34 25 6,500 MSL
- 6 N34 37 39 W 117 37 28 6,500 MSL

### **Gray Butte Field (04CA) Airport**

#### **South Emergency Mission MQ-9**

##### **Waypoints Altitude**

- 1 N34 32 43 W 117 43 24 6,000 MSL
- 2 N34 33 43 W 117 42 23 6,000 MSL
- 3 N34 33 44 W 117 39 16 6,000 MSL
- 4 N34 32 45 W 117 38 07 6,000 MSL
- 5 N34 31 45 W 117 39 21 6,000 MSL
- 6 N34 31 45 W 117 42 13 6,000 MSL

#### **South High Emergency Mission MQ-9**

##### **Waypoints Altitude**

- 1 N34 32 43 W 117 43 24 7,000 MSL
- 2 N34 33 43 W 117 42 23 7,000 MSL
- 3 N34 33 44 W 117 39 16 7,000 MSL
- 4 N34 32 45 W 117 38 07 7,000 MSL
- 5 N34 31 45 W 117 39 21 7,000 MSL
- 6 N34 31 45 W 117 42 13 7,000 MSL



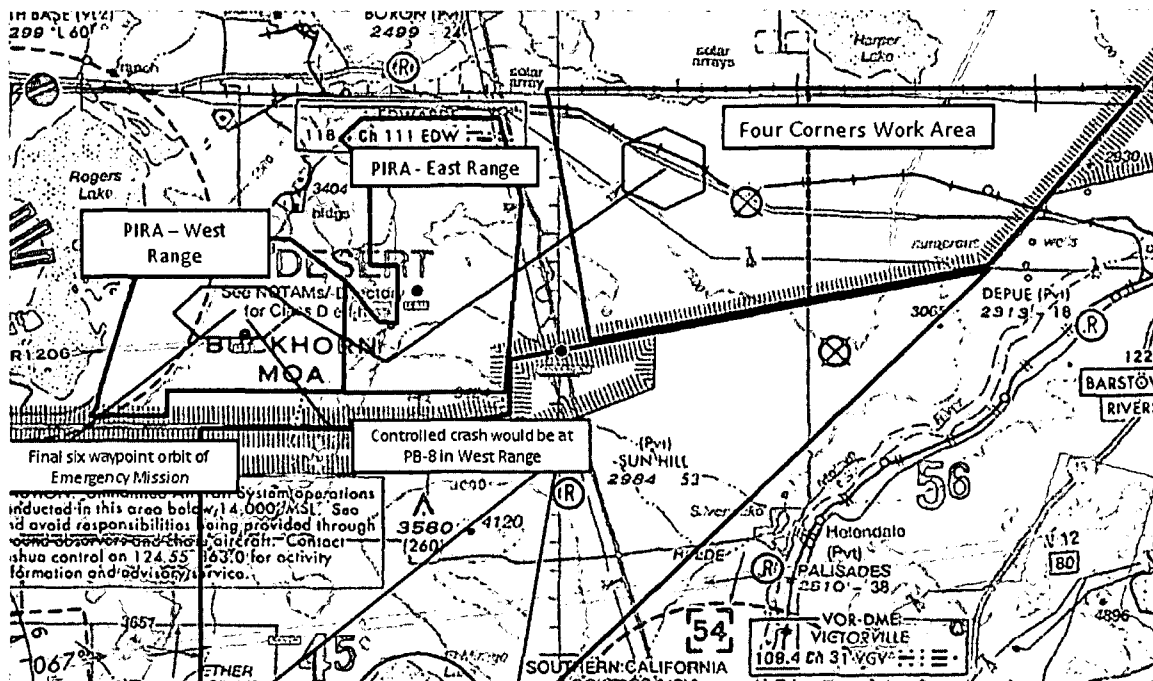


Figure 2: PIRA West Range and Four Corners Work Area

3.2.4 During UAS operation, two-way radio communication will be maintained between the UAS pilot/operator, chase plane and the appropriate FAA Air Traffic controlling facility. If communication cannot be maintained by the UAS pilot / operator, chase plane or the appropriate FAA Air Traffic controlling facility, the UAS will expeditiously return to its base of operations and the flight will be terminated. Telephone notification of loss of two way radio communications will be made to High Desert TRACON (E10) at (661) 277-3843.

3.2.5 The UAS and the chase plane will have position and strobe lights on at all times. If any of these systems on either aircraft are inoperative the flight will be cancelled.

3.2.6 GA-ASI, and/or its representatives are responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to Altair.

3.2.7 From sunrise to sunset (daytime), UAS operations may be conducted from the surface (3,020') to 6,000 feet mean sea level (MSL), with Altair operator and a ground observer, who is in direct communication with the UAS operator, providing see-and-avoid duties for the UAS. For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, restricted areas, and warning areas. The observers may either be ground based or in a chase plane. The UA must remain within a lateral distance of **no more than two and one half (2.5) nautical miles from the visual observer**. The distances listed are the maximum distance; at no time will the UA be operated at





a distance beyond the visual line of sight for the visual observer. If the chase aircraft is operating more than 100ft above/below the UA altitude, the chase aircraft PIC will advise the controlling ATC facility.

3.2.8 High Desert TRACON (Joshua Approach) may provide traffic advisories to the chase aircraft during the UAS operation. In the event that controller workload prohibits this service, or two-way radio communications cannot be maintained, Altair operation shall be canceled.

3.2.9 GA-ASI will fax High Desert TRACON a daily squawk code request sheet to 661-258-4850 for local operations that will remain below 13,000' or that will operate in the R-2508 Complex. The daily squawk request shall be received by TRACON at least one hour prior to the first scheduled flight from either El Mirage or Grey Butte airport. If TRACON cannot accept the coordinated information, TRACON shall contact the appropriate user. The beacon code assignments are:

Call Sign Det 3	Transponder Code	Call Sign GA-ASI	Transponder Code
VEGAS01	5201	UAV11/DISCO11	5211
VEGAS02	5202	UAV12/DISCO12	5212
VEGAS03	5203	UAV13/DISCO13	5213
VEGAS04	5204	UAV14/DISCO14	5214
VEGAS05	5205	UAV15/DISCO15	5215
VEGAS06	5206	UAV16/DISCO16	5216
VEGAS07	5207	UAV17/DISCO17	5217

The chase aircraft transponder will be on standby while in formation with Altair, but shall be turned on when separated. Altair's transponder will be turned on and set to the ATC assigned code any time Altair is operating. In the case of a transponder failure on either Altair or the chase aircraft, Altair operation shall be terminated.

3.2.10 GA-ASI will contact Prescott (PRC), AZ Automated Flight Service Station (AFSS) HUB facility at 877-487-6867, at least twenty-four hours prior to each event to issue a Notice to Airmen (NOTAM). GA-ASI will provide the location, altitude, and times of operation as a minimum. The center of the operating area may be described using either the Palmdale VOR (PMD) or Victorville VOR (VCV). GA-ASI will provide PRC AFSS any additional information requested for NOTAM purposes.

3.2.11 Altair pilot in command (PIC) will hold, as a minimum, a valid FAA commercial pilot certificate with an instrument rating. The Altair operator shall control only one UAS at any one time. The chase aircraft or ground observer will perform see and avoid duties for the UAS.



3.2.12 All Altair operations will be performed under the established GA-ASI inspection and maintenance procedures.

3.2.13 Altair operations will be performed under our established quality management system for engineering, production, delivery, servicing, and ground and flight operations in a manner that is continually surveyed and acceptable in accordance with established GA-ASI procedures.

3.2.14 Research and development flight testing will be conducted according to our company Flight Readiness Review process which establishes that Altair is flight ready and suitable for safe operation.

3.2.15 Altair UA will not perform any aerobatic maneuvers and will adhere to the minimum fuel requirements contained in 14 CFR 91.151.

#### 3.2.16 Program Summary

Estimated Flight Hours	300 hours
Estimated Number of Flights	40 flights
Duration	1 year

Table 2: Altair Program Summary

## 4. AIRCRAFT CONFIGURATION.

The Altair is a remotely piloted turboprop aircraft. The aircraft is a 7,500 lb GTOW mid-wing monoplane with high-aspect-ratio wing, v-tails, and conventional landing gear. The Altair is constructed of graphite composites and incorporates a 750 SHP Honeywell TPE-331-10Y-511GA turbo-prop engine and a 9.2' McCauley 3-bladed propeller in a pusher configuration. The aircraft is designed to +3.8/-1.5 g limit load and +5.7/-2.3g ultimate load. The aircraft provides substantial reliability and safety features which allow the aircraft to survive any foreseeable single avionics failure and is equipped with (triple) redundant avionics and flight control system, Mode S Transponder, ice detection, standard aviation lighting, and redundant forward looking video. The aircraft holds 3,030 lbs of fuel (Jet A+, Jet A-1, JP-8) in seven fuel tanks incorporated in the fuselage and wings and has a max endurance of 34 hours. Max Altitude is 54,000 ft. Vc at 12Kft is 151 KTAS. Max range round trip is 3,400 nm.

The Altair aircraft is controlled by a pilot who is located in the GCS. A pair of cameras, mounted in the nose of the aircraft provide, the pilot with a forward view

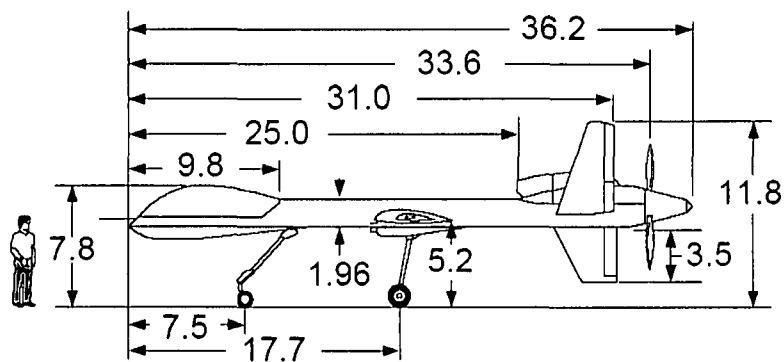
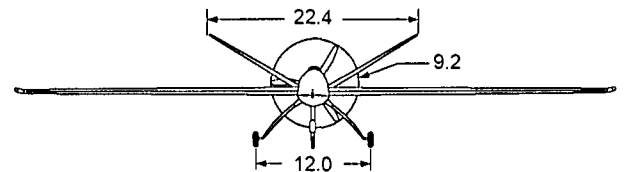
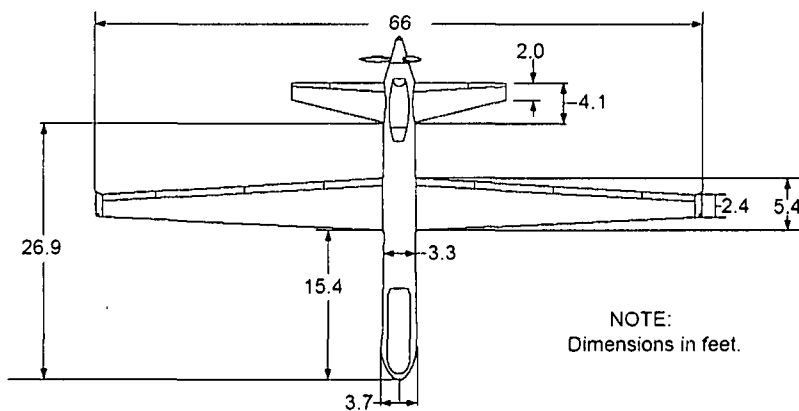


using either daylight television or infrared (IR) images. Control commands are transmitted from the GCS to the aircraft by a ground-based datalink terminal.

The GCS incorporates workstations that allow operators to plan missions, control and monitor the aircraft, payload sensors and weapons, and exploit received images. The Data Link Subsystem is the same communications systems as is currently operational with the MQ-1 Predator and MQ-9 Reaper aircraft. The aircraft can be controlled from the ground via two modes of communication: Line-of-Sight (LOS) or SATCOM Beyond Line-of-sight (BLOS). LOS operates in the C-band while SATCOM operates in the Ku-band.



The following figure (Figure 2) provides identification of the Altair aircraft:







## **5. INSPECTION AND MAINTENANCE (14 CFR § 91.7).**

All Altair UAS will be inspected and maintained in accordance with the General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992. Each inspection will be recorded in the UAS maintenance records. A condition inspection will be conducted in accordance with FAA-approved, General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992 and will be recorded in the UAS maintenance records. Only individuals authorized by General Atomics, and acceptable to the FAA, may perform inspections. Inspections will be recorded with the statement, "I certify that this UAS has been inspected on [date] in accordance with the scope and detail of the the General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992, and was found to be in a condition for safe operation". The entry will include the UAS's total time-in-service and the name and signature of the person performing the inspection. The altimeter and transponder will be tested no less than once every 24 months in accordance with 14 CFR § 91.411 and 14 CFR § 91.413 respectively and will be recorded in the UA maintenance records.

## **6. PILOT QUALIFICATION (14 CFR § 61.3, 61.5).**

Pilot qualification and flight review will be conducted IAW company procedure ASI-00009 (Civil). All GA-ASI pilots are required to possess at least an FAA commercial certified pilot certificate with instrument rating and a Class II medical. All GA-ASI pilots are required to successfully complete a formal company training program for the company aircraft type (ex. Predator A, Predator B, etc.) Company training incorporates class instruction, simulation, and flight training. Company flight instructors will be required to hold a FAA instructor rating beginning in January 2009. All GA-ASI pilots are required to maintain flight proficiency, complete annual oral and written exams, and pass an annual flight evaluation. All GA-ASI pilots are required to maintain instrument currency in manned aircraft.

Observer training includes ground observer training (trained in Right-of-Way Rules (14 CFR § 91.113) and Operating near Other Aircraft (14 CFR § 91.111) per the "A & P Training Program / Flight Operations Support Training" document) and airborne observer training which requires knowledge and understanding of rules and responsibilities described in § 91.111 (Operating near other aircraft), § 91.113 (Right of way rules: Except water operations) and § 91.155 (Basic VFR weather minimums. Observer training includes training and understanding of air traffic and radio communications, to include the use of approved ATC/pilot phraseology, and knowledge and understanding of appropriate sections of the Aeronautical Information Manual.

## **7. AIRCRAFT MARKINGS (14 CFR Part 45)**

The aircraft will be outfitted with external identification / markings in accordance with 14 CFR § 45.



## **8. ATC TRANSPONDER AND ALTITUDE REPORTING SYSTEM EQUIPMENT AND USE (14 CFR § 91.215)**

The Altair unmanned aircraft system has an altitude reporting transponder capable of Mode S.

## **9. METHOD FOR SEE AND AVOID (14 CFR § 91.113).**

The pilot in command of the Altair UA is responsible for seeing and avoiding other traffic using real time video image displays coming from: a) either of the two fixed forward-looking nose cameras, configured as two 30°FOV EO or one EO plus a Mid range FLIR (40°FOV), or b) the EO/IR turreted surveillance camera system (3 sensors with Field Of Regard covering full 360° of lower hemisphere plus above horizon capability for the forward viewing perspective in the region of +10°).

To assist the pilot, an observer either in a chase plane or on the ground will be used. These observers will maintain real time audio contact with the pilot.

The task of the observer is to provide the pilot of the UAS with advisory information to enable the pilot to maneuver the UAS clear of any other traffic. At no time shall visual observers conduct their duties more than 3.0 nm laterally or 3000 feet vertically from the UA. When a chase aircraft is utilized, it must maintain a reasonable proximity, and shall position itself relative to the UAS in such a manner to reduce the hazard of collision per 14 CFR § 91.111.

UAS pilots and observers shall perform crew duties for only one UAS at a time. Observer's duties shall be dedicated to the task of observation only, concurrent duty as a pilot is not authorized.

**10. SAFETY RISK MANAGEMENT.** The FAA Safety Checklist has been previously submitted to the FAA.

## **11. SYSTEM CONFIGURATION**

The Altair UA System is designed with the following elements:

Redundant Control Module (RCM):

- RCM processor and Input/Output (I/O) technology, implemented within its triplex architecture, using three independent flight computers.
- Dual independent voter circuits, each connected to all three processors and a dedicated UARB network.
- An independent power supply for each flight computer.
- The RCM also accommodates video switch circuitry to support the dual redundant nose cameras plus the video paths from the optional EO/IR payload sensor suite.
- Dual UARB network design.



#### Redundant control surfaces

- Four aileron panels, two on each wing
- Four trailing edge flap panels, two on each wing
- Four ruddervator panels, two on each diagonal tail surface
- One rudder on the ventral fin.

Each of the thirteen (13) control surfaces is actuated by a DC brushless “smart” servo. These servo actuators are commanded via dedicated dual redundant serial buses that convey control surface commands from the triplex redundant flight computer RCM. Each servo assembly employs a microcontroller with dedicated microprocessor failure detection that defaults to pre-programmed state, when detected, to minimized aerodynamic effects (disconnect input drive, set to failure mitigating position).

**Datalink:** The datalink consists of a radio frequency uplink and downlink which establish full duplex communication between the airborne datalink terminal in the aircraft and the ground-based datalink terminals associated with the GCS. A continuous stream of control commands is transmitted to the aircraft, and the aircraft transmits a continuous stream of status and imagery data to the GCS. The datalink can be maintained by a C-band LOS datalink system or a Ku-band SATCOM datalink system. Aircraft control commands are entered from Pilot/Sensor Operator (PSO) workstations inside the GCS. These commands are routed to the selected GDT where they are incorporated into the uplink or command link. The aircraft receives commands and routes them to the aircraft Redundant Control Module (RCM) for execution. The RCM also receives reconnaissance sensor imagery and telemetry data from aircraft subsystems. The RCM processes this data and incorporates it into the Ku-band Return Link (RL) or LOS downlink. The GDT receives the LOS downlink, processes the data, and routes it to the GCS for display on PSO workstations, while the Ku-band system receives the return link and routes it to the GCS for processing and display. For maintenance purposes, a direct connect capability is provided that allows the datalink to be established via an interconnect cable between the GCS and the aircraft versus the normal RF mode of operation.

**Communication:** The Altair system utilizes an ARC-210 UHF/UHF communications radio installed in the aircraft. This equipment is controlled from the GCS by on-screen commands with six selectable frequency bands available as shown in the table below. The operator(s) can communicate with Air Traffic Control (ATC) when using the 108.000 MHz thru 117.975 MHz AM band.



Frequency	Band
30.000 to 87.975	FM
108.000 to 117.975	AM
118.000 to 135.975	AM
136.000 to 155.975	AM / FM
156.000 to 173.975	FM
225.000 to 399.975	AM / FM

Table 2: ATC Radio Frequencies and Bands

**Aircraft Electrical Power:** the electrical power system incorporates two independent 28 VDC electrical buses and distributes 28 VDC power to all aircraft electrical / electronic components. The system includes an engine driven starter/generator, a dual redundant power bus, and batteries for backup power.

**Navigation Sensor Suite:** The navigation sensor suite employs the LN 100G Inertial Navigation System with a triple IMU unit and a triple GPS unit. The triple string of data is conveyed to the triple redundant RCM and voted and selected using techniques implemented and flying on Altair and Predator B aircraft.

**Ground Control Station:** GA-ASI Ground Control Station (GCS) is common to all GA-ASI Predator aircraft. Aircraft type differences are accommodated through matching of tail number and system configuration ID resident in aircraft and GCS S/W. This approach circumvents a GCS controlling an aircraft with a different setup (i.e. piston engine controls versus turbine). Multiple GCSs at both GA-ASI Gray Butte and El Mirage, California flight test center facilities provide multiple GCS backup options. Altair will be flown from a fixed GCS which is backed up by an emergency generator in case of a power failure.

## **12. SYSTEM SAFETY - FLIGHT TERMINATION AND LOST LINK**

The Altair system redundancy maintains a high level of UAS operational integrity permitting continued control and safe piloting of the UAS throughout its mission, from launch through to recovery. This is the principal means of maintaining containment of operations within the agreed locations and altitudes of the Experimental Certification limitations. To address failures that cannot be assured to maintain containment, there are several Flight Termination modes embedded within the Altair system to address these.

**Pilot controlled descent and touch down:** This may be used with engine out when beyond glide range of either the El Mirage or Grey Butte recovery airfields. The





pilot flies to the touch down point using the same Emergency Mission established rules but with the benefit of man-in-the-loop control to minimize hazard exposure to people on the ground, thereby enabling safety containment. The hazard circumvented is touch down into an unplanned location with risk of harming people on the ground. For loss of alternator power and flight within the confines defined herein, there is sufficient battery capacity to enable continued powering of core systems to effect return and landing at either El Mirage or Gray Butte.

Lost Link Mission: This contains features to prevent aircraft flyaway by flying a predetermined course to reestablish link. This function is the same as used across all GA-ASI platforms and is implemented within the triplex flight computer therefore having the same integrity as the flight critical elements.

Prevention of fly away at loss of the triple flight computer function is accomplished by the tail servos moving full trailing edge up and engine controls set to shut down. This is effected by the servo electronics programmed to move to preprogrammed default positions after loss of valid flight computer commands. The engine control electronics similarly default to engine out at loss of flight computer propulsion commands. To assist in voice communications capability for these emergency cases, backup radios are contained in the GCS. If the backup radios cannot establish communications, the crew utilizes a land/cell/sat phone and calls the appropriate controlling agency.

### **13. COMMAND AND CONTROL**

The datalink is maintained by either the C-band Line-Of-Sight (LOS) system or the Ku-band Satellite Communication (SATCOM) system. These systems are common to all GA-ASI UAS operations.

Pilot control commands and returned telemetry are conveyed via these datalink systems using a common data format.

Ground Datalink Terminals (GDT) are comprised of a C-band GDT and a Ku-band GDT. Maximum range of the C-band GDT is about 130 nautical miles (nm). The Ku-band SATCOM GDT is limited only by satellite coverage.

### **14. CONTROL STATIONS**

Ground Control Station - The Altair aircraft is flown by a pilot from a Ground Control Station (GCS). The GCS can be located in a building or in a portable shelter. The GCS incorporates two identical side-by-side Pilot / Sensor Operator (PSO) workstations. At any given time one PSO is assigned to the Pilot mode and the other to the Sensor Operator. A centrally mounted switch, under the control of the Pilot, determines which of the PSO workstations has been assigned control of the aircraft. The switch essentially toggles the modes of the



PSO stations permitting pilot control to be transferred in the case of a PSO malfunction, providing control redundancy for the pilot. The design of the PSO is primarily based on serving the pilot function. When in the Sensor Operator mode the same controls and displays are functionally re-configured for sensor operation. Figures 6a and 6b provide views of the PSO lay-out.

Both PSO stations are connected to the data links. In relation to data link operation, pilot and sensor commands are combined for uplink and the same downlink information sent to both PSO racks. The operating mode of the PSO and the selected display configuration then determines what downlink information is displayed.

The aircraft is primarily operated real-time by the pilot (pilot-in-the-loop) and is also capable of flying pre-programmed missions. The aircraft can be flown line-of-sight to approximately 130nm of the GCS utilizing the C-Band data link, or operated beyond line-of-sight with the Ku-Satcom data link.

**Pilot Configuration** - To provide the pilot's control function, the display and control features of the PSO station are described in the following:

**Upper Video Screen** – The Upper Video Screen displays a moving symbol of the aircraft over a map (Tracker Display). This enables the pilot to monitor and modify the aircraft's flight plan.

**Lower Video Screen** – The Lower Video Screen displays imagery capture by a fixed field-of-view nose camera with 30 degree field of view. The nose camera view is the background or "underlay" of information presented on the Lower Video Screen. The overlay to the nose camera video is a HUD style format that shows primary aircraft system operational and performance parameters. The principle information displayed in the HUD is: Angle of Attack, Pitch Angle, Air Speed, Vertical Speed, Engine Performance Parameters, Horizon, distance from the Ground Data Terminal, Gear Position, Current Barometer Setting, Heading, Yaw Rate, and Center of the Field of View. The Lower Video Screen thereby supports the pilot's responsibilities of Primary Aircraft System Monitoring and Performing Takeoffs and Landings.



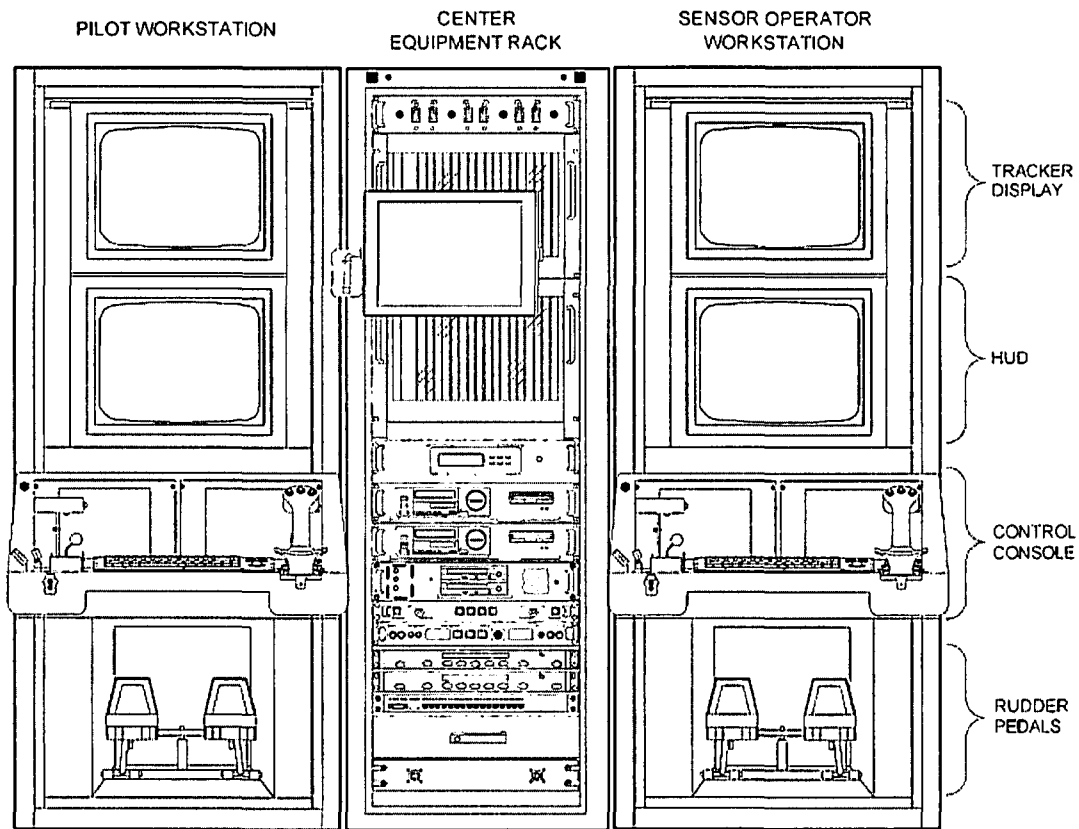


Figure 3: Ground Control Station

**Headset / Microphone Audio** – The Headset and Microphone operate the same as in manned aircraft. The headset enables the Pilot to communicate with the Flight Crew, Air Traffic Control, and other aircraft pilots. In addition to aerial communications, the headset also enables the Pilot to communicate with Ground Crew equipped with similar headsets out on the Flight Line.

**Flight Controls** – Pilot control is performed through a console-mounted joystick for pitch and roll commands, and rudder pedals with embedded foot brake controls. Rudder pedal action jointly controls the rudders and nose wheel steering with gear down and the brake function permits differential control of the Main Landing Gear brakes. In addition, the console also has control levers for engine power and flap control. Buttons are also located on throttle and joystick controls for related mode selection and ancillary controls. Landing gear retraction and deployment are activated through a joystick button and trigger switch interlocked with airspeed limits to prevent inadvertent ground retraction.



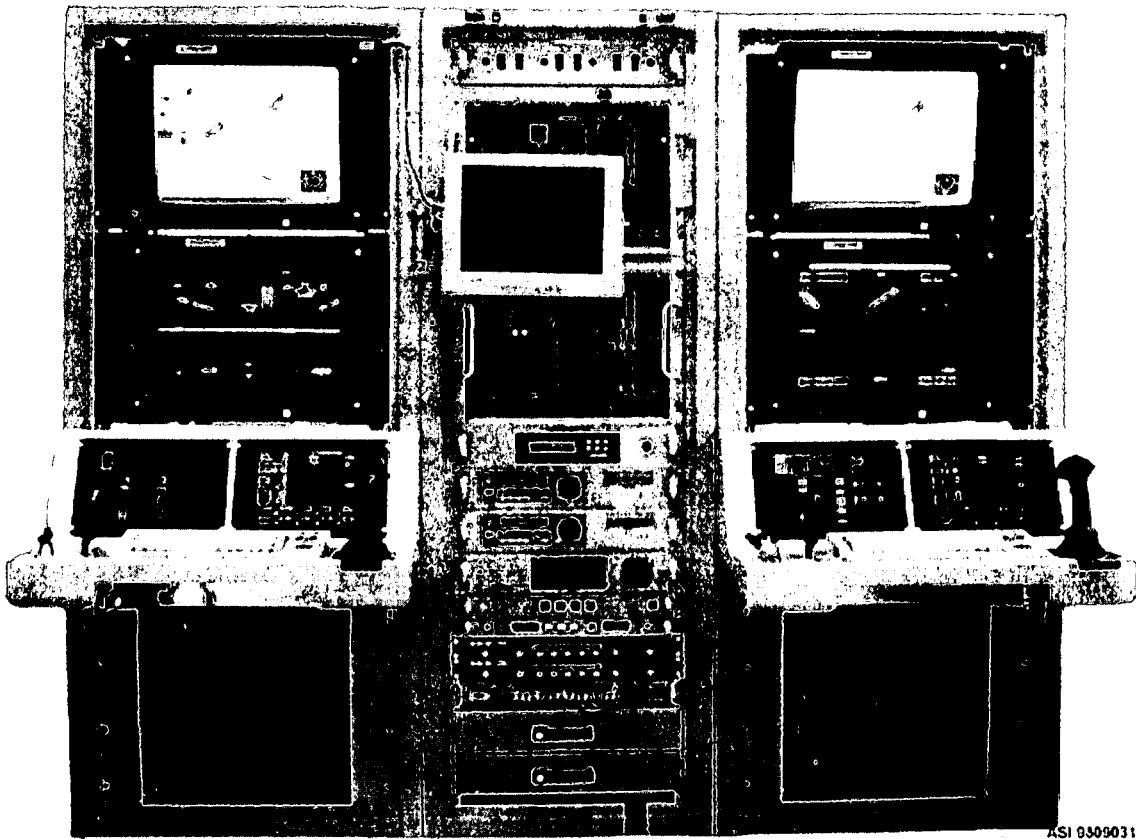


Figure 4: Ground Control Station

**Keyboard** – The Keyboard is used in conjunction with the flight controls for overall aircraft system control. Information entered via the keyboard may include Waypoints for Flight Path Navigation, Radio Frequencies for Communication, etc. In addition to entering information, the keyboard is also used to select and configure aircraft systems as required.

**Aircraft Control Switch** – The Aircraft Control Switch determines which of the two Flight Crew Positions has active control of the aircraft. The switch is located within ready access of the pilot. The Aircraft Control Switch enables the Pilot to designate the PSO workstation to perform all the vehicle control and monitoring activities.

**Cumulative System** – The integrated system (including information obtained from the Payload Operator and System Engineer) provides the Pilot with Situational Awareness. Situational Awareness supports all the Pilot's responsibilities: Pilotage, Communications, Takeoffs, Landings, and Primary Aircraft System Monitoring and Configuration.





## **15. CONTROL FREQUENCIES**

The Altair aircraft is controlled by either a C-band line-of-sight (LOS) or a Ku-band over-the-horizon Satellite Communications (SATCOM) data-link system. Control signals are processed by the PSO workstation and sent to either the C-band Ground Data Terminal (GDT) or the Ku-band SATCOM GDT for transmission to the aircraft. Specific frequencies governed by FCC Experimental Radio Station Construction Permit and License File Number 0082-EX-MIL-2006 dated 21 August 2007 (previously submitted to FAA).



# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
12/31/2010

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																																																																																																																																																																																																														
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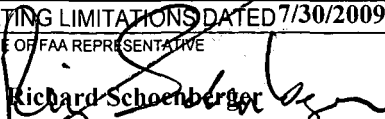


<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER							
	NAME		ADDRESS					
	B. PRODUCTION BASIS <i>(Check applicable item)</i>							
	<input type="checkbox"/>	PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> _____						
	<input type="checkbox"/>	TYPE CERTIFICATE ONLY						
	<input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM							
C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS								
DATE OF APPLICATION		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE				
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	A. DESCRIPTION OF AIRCRAFT							
	REGISTERED OWNER		ADDRESS					
	BUILDER <i>(Make)</i>		MODEL					
	SERIAL NUMBER		REGISTRATION MARK					
	B. DESCRIPTION OF FLIGHT      CUSTOMER DEMONSTRATION FLIGHTS <input type="checkbox"/> <i>(Check if applicable)</i>							
	FROM		TO					
	VIA		DEPARTURE DATE	DURATION				
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT							
	<input type="checkbox"/>	PILOT	<input type="checkbox"/>	CO-PILOT	<input type="checkbox"/>	FLIGHT ENGINEER	<input type="checkbox"/>	OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:							
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>							
	F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.							
	DATE		NAME AND TITLE <i>(Print or Type)</i>			SIGNATURE		
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAADESIGNEE use only)</b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.			G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>			<input checked="" type="checkbox"/> I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191</u> CAR _____ <i>(Original Attached)</i> <u>(a), (c), (f)</u>			
	<input checked="" type="checkbox"/>	D. Current Weight and Balance information Available in Aircraft <u>GCS</u>						
	<input type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>			<input checked="" type="checkbox"/> J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191(a), (c), (f)</u> <i>(Copy Attached)</i>			
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records			K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>			



UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

**SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development / Crew Training / Market Survey</b>	
<b>B</b>	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>7/30/2009</b>	EXPIRY <b>7/29/2010</b>
	OPERATING LIMITATIONS DATED <b>7/30/2009</b>	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Richard Schoenberger</b>	DESIGNATION OR OFFICE NO.  <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

<b>A</b>	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
<b>B</b>	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
<b>C</b>	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
<b>D</b>	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
<b>E</b>	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.



UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION <b>SPECIAL AIRWORTHINESS CERTIFICATE</b>			
<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>		
	PURPOSE <b>Research and Development / Crew Training / Market Survey</b>		
<b>B</b>	MANU-FACTURER	NAME	N/A
		ADDRESS	N/A
<b>C</b>	FLIGHT	FROM	N/A
		TO	N/A
<b>D</b>	N- <b>8172V</b>		SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>		MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>7/30/2009</b>		EXPIRY <b>7/29/2010</b>
	OPERATING LIMITATIONS DATED <b>7/30/2009</b>		ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE <i>Richard Schoenberger</i>		DESIGNATION OR OFFICE NO. <b>ANM-108L</b>
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FAA Form 8130-7 (07/04)

SEE REVERSE SIDE

NSN: 0052-00-693-4000

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION <b>SPECIAL AIRWORTHINESS CERTIFICATE</b>			
<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>		
	PURPOSE <b>Research and Dev/Market Surv/Crew Training</b>		
<b>B</b>	MANU-FACTURER	NAME	N/A
		ADDRESS	N/A
<b>C</b>	FLIGHT	FROM	N/A
		TO	N/A
<b>D</b>	N- <b>8172V</b>		SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>		MODEL <b>UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>08/12/10</b>		EXPIRY <b>08/11/11</b>
	OPERATING LIMITATIONS DATED <b>08/12/10</b>		ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE <i>Richard Schoenberger</i>		DESIGNATION OR OFFICE NO. <b>ANM-108L</b>
	Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).		

FAA Form 8130-7 (07/04)

SEE REVERSE SIDE

NSN: 0052-00-693-4000





# AIRCRAFT MAINTENANCE RECORD

AIRCRAFT/EQUIPMENT S/N	FLIGHT #	ORIGINATOR	DISC	DATE	NCR #	FDR #
N8172V		F. MARTIN DEL CAMPO		8/11/2010		

## DISCREPANCY:

THE UAS requires an FAA Airworthiness inspection with regards to the application for special Airworthiness Certificate Experimental for R&D / crew training / market survey  
Dated:

## CORRECTIVE ACTION: CAMS SCREEN 122 TAG NUMBER IS THE AFTO 350 TAG NUMBER.

I find this UAS meets the requirements for the certification requested and have issued a special AW/CERT Dated: 8/12/2010  
The operation of this UAS is contingent upon GA-ASI compliance with program letter dated: 7/29/2010 and the applicable operating limitations for this UAS dated: 8/12/2010 CONT:

## DISPOSITION: CONT:

A new condition inspection is required prior to issuance of another special AW/CERT

RICHARD SCHOENBERGER  
ASI FAA LA-MIDO

## PARTS REMOVED

	PART NUMBER	REV	SERIAL NUMBER	NOMENCLATURE	SERIAL TRACK #	HOURS/CYCLES
A						
B						
C						
D						
E						

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION	
<b>SPECIAL AIRWORTHINESS CERTIFICATE</b>	
<b>A</b>	CATEGORY/DESIGNATION <u>EXPERIMENTAL (UNMANNED AIRCRAFT)</u> PURPOSE <u>Research and Dev/Market Surv/Crew Training</u>
<b>B</b>	MANUFACTURER NAME <u>N/A</u> ADDRESS <u>N/A</u>
<b>C</b>	FLIGHT FROM <u>N/A</u> TO <u>N/A</u>
<b>D</b>	N- <u>8172V</u> SERIAL NO. <u>AA001</u> BUILDER <u>General Atomics ASI</u> MODEL <u>UPB97010-1</u> DATE OF ISSUANCE <u>08/12/10</u> EXPIRY <u>08/11/11</u> OPERATING LIMITATIONS DATED <u>08/12/10</u> ARE PART OF THIS CERTIFICATE
<b>E</b>	SIGNATURE OF FAA REPRESENTATIVE <u>Richard Schoenberger</u> DESIGNATION OR OFFICE NO. <u>ANM-108L</u>
Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).	
FAA Form 8130-7 (07/04) SEE REVERSE SIDE NSN: 0052-00-693-4000	

AVION PRE	ENGINE HOBBS PRE / POST <u>/</u>
CORRE	EMPLOYEE NUMBER

WORK ORDER #	LOCATION	350 TAG NUMBER	PROJECT NUMBER
SERIAL NUMBER	SYSTEM/REASON	UP	DOWN





Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

**Operating Limitations**  
**Experimental: Research and Development, Market Survey,**  
**and/or Crew Training**

<b>REGISTERED OWNER NAME:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.	<b>AIRCRAFT BUILDER:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.
<b>REGISTERED OWNER ADDRESS:</b> 14200 KIRKHAM WAY POWAY, CA 92064	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT DESCRIPTION:</b> ALTAIR UNMANNED AIRCRAFT	<b>AIRCRAFT MODEL DESIGNATION:</b> ALTAIR – UPB 97010-1
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>ENGINE MODEL:</b> HONEYWELL TPE331-10Y-511GA
<b>YEAR MANUFACTURED:</b> 2003	<b>PROPELLER MODEL:</b> MCCAULEY/3GFR36C606-B

The following conditions and limitations apply to all flight operations for the General Atomics Aeronautical Systems, Inc., (GA-ASI) Altair unmanned aircraft system (UAS) while operating in the National Airspace System (NAS).

**1. General Information.**

**a. Integrated system.** For the purposes of this special airworthiness certificate and operating limitations, the Altair Unmanned Aircraft System (UAS) operated by GA-ASI is considered to be an integrated system. The system is composed of the following:

- (1) Altair unmanned aircraft, model UPB97010-1.
- (2) UAS control station(s), fixed, mobile, ground-based, or airborne.
- (3) Telemetry, launch, and recovery equipment.
- (4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Altair UAS.



(5) Equipment on the ground and in the air used for communication with the chase aircraft, other members of the flight crew, observers, air traffic control (ATC), and other users of the NAS.

**b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules).** Unless otherwise specified in this document, the UA pilot-in-command (PIC) and GA-ASI must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

**c. Operational requirements.**

(1) No person may operate this UAS for other than the purpose of research and development and/or crew training, to accomplish the flight operation outlined in GA-ASI Program Letter dated 07/29/2010, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

(2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

(3) GA-ASI must accumulate at least 50 flight hours flight time on the UAS before customer crew training is permitted, in accordance with § 21.195(d), Experimental certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

**d. UA condition.** The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

**e. Multiple-purpose operations.** When changing between operating purposes of a multiple purpose certificate, GA-ASI must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

**f. Operation exceptions.** No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

**g. UA markings.**

(1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division, AIR-200.

(2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

**h. Required documentation.** Prior to conducting the initial flight operations, GA-ASI must forward a scanned electronic copy of the Program Letter, and signed copies of the Special Airworthiness Certificate, and Operating Limitations to the following persons by email:

(1) FAA Western Terminal Service Area, Mark Dillon, Unmanned Aircraft Systems, Air Traffic Control Specialist, Operations Support Group-NISC contractor, ATO, Western





Service Center, Operations Support Group, AJV-W23, [mark.ctr.dillon@faa.gov](mailto:mark.ctr.dillon@faa.gov), telephone (425) 203-4522.

(2) Richard Posey, Aviation Safety Inspector, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, telephone (202) 385-6378 email [richard.posey@faa.gov](mailto:richard.posey@faa.gov).

**i. Change in registrant address.** Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

**j. Certificate display and manual availability.** The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, General Rulemaking Procedures, to GA-ASI.

**2. Program Letter.** The Altair Program Letter, dated 07/29/2010, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

### **3. Authorized Flight Operations Area.**

**a. General.** All operations will be conducted in accordance with the FAA accepted GA-ASI Flight Operations Procedures, ASI-00009 (Civil), and GA-ASI Ground Operations Procedures, ASI-00056 (Civil).

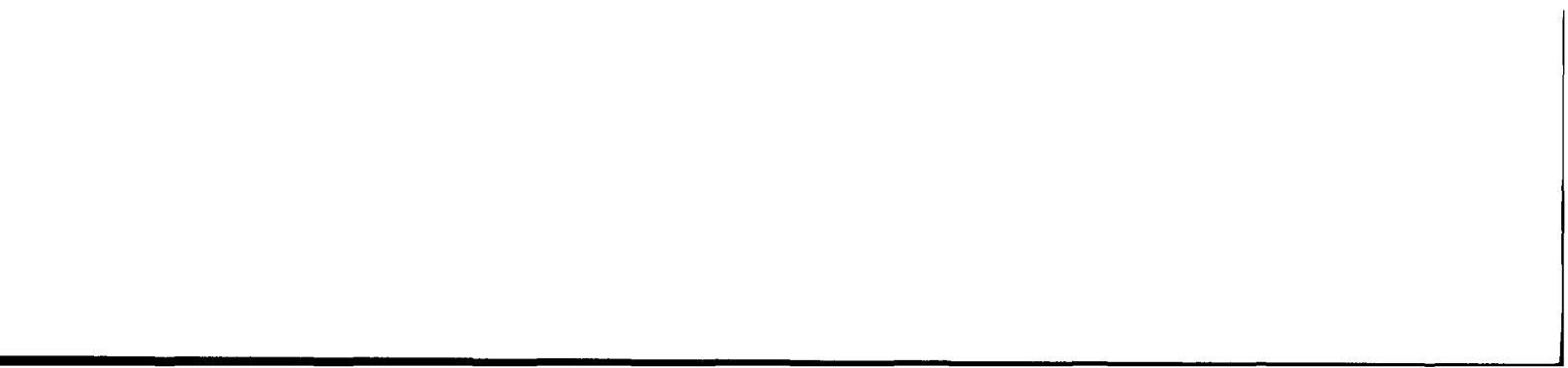
(1) VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in.

(2) Special VFR is not authorized.

**b. Description of the authorized flight operations area.** The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

**c. Flight test area.** The flight operations area authorized for the Altair UA will be referred to as the Primary Containment Area (PCA) and is depicted graphically below in blue. Flight operations in the PCA shall be conducted within the defined boundaries at or below 13,000 ft MSL. When operating in a terminal environment, the UA must have line of sight communications. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. The PCA is identified as follows:

11



**Local Ops Area - BLUE**

SW	N34°31'00"	W 117°45'00"
NW	N34°48'00"	W 117°45'00"
N1	N34°48'00"	W 117°35'03"
N2	N34°48'30"	W 117°32'03"
N3	N34°50'15"	W 117°32'03"
NE	N34°53'30"	W 117°11'53"
E1	N34°39'30"	W 117°30'00"
SE1	N34°34'00"	W 117°30'00"
SE2	N34°31'00"	W 117°37'00"

**Lost Link Orbit Points****El Mirage (99CL) Airport – RED****North Emergency Mission MQ-9 Waypoints****Approved Orbit  
Altitudes**

1 N34 38 32 W 117 38 39	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
2 N34 39 36 W 117 37 25	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
3 N34 39 35 W 117 34 29	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
4 N34 38 32 W 117 33 20	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
5 N34 37 38 W 117 34 25	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
6 N34 37 39 W 117 37 28	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL

**Gray Butte Field (04CA) Airport – YELLOW****South Emergency Mission MQ-9 Waypoints****Approved Orbit  
Altitudes**

1 N34 32 43 W 117 43 24	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
2 N34 33 43 W 117 42 23	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
3 N34 33 44 W 117 39 16	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
4 N34 32 45 W 117 38 07	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
5 N34 31 45 W 117 39 21	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL
6 N34 31 45 W 117 42 13	5,500 MSL	6,500 MSL	7,500 MSL	8,500 MSL



**d. Authorized flight times and conditions.** All flight operations must be conducted during daylight hours under visual flight rules (VFR). It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g., spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the PCA. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

**e. Fuel limitation.** Fuel shall be limited to that necessary to complete the intended mission plus 250 pounds.

**f. Criteria for remaining in the flight test area.** The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the PCA. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

**g. Incident/accident reporting.** Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AFS-407. AFS-407 can be reached by telephone at 202-385-4636 and fax at 202-385-4651. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations must not be conducted until the incident is reviewed by AFS-407 and authorization to resume operations is provided to GA-ASI.

#### **4. UA Pilots and Observers.**

##### **a. UA PIC roles and responsibilities.**

(1) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.

(2) The UA PIC must perform crew duties for only one UA at a time.

(3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground.

(4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

##### **b. UA PIC certification and ratings requirements.**

(1) UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

(2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.



**c. UA PIC currency, flight review, and training.**

(1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.

(2) The UA PIC must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(3) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(4) All UA PICs must have successfully completed applicable GA-ASI company training for the UAS.

(5) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**d. Supplemental UA pilot roles and responsibilities.**

(1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.

(2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.

(3) A supplemental UA pilot must perform crew duties for only one UA at a time.

**e. Supplemental UA pilot certification.** The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

**f. Supplemental UA pilot currency, flight review, and training.**

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(3) All UA pilots must have successfully completed applicable GA-ASI training for the UAS.

(4) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.





**g. Observer roles and responsibilities.** The task of the observer is to provide the UA PIC with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

- (1) The observer must perform crew duties for only one UA at a time.
- (2) At no time will the observer permit the UA to operate beyond the line-of-sight necessary to ensure maneuvering information can be reliably determined.
- (3) At no time will the observer conduct his/her duties more than 2.5 nautical miles laterally or 3000 ft vertically from the UA.
- (4) An observer must maintain visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.
- (5) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.
- (6) Observers must continually scan the airspace for other aircraft that pose a potential conflict.
- (7) All flight operations conducted in the flight test area must have an observer to perform traffic avoidance and visual observation to fulfill the see-and-avoid requirement of § 91.113, Right-of-way rules: Except water operations.

**h. Observer certification.**

- (1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.
- (2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

**i. Observer training.**

- (1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.
- (2) All observers must have successfully completed applicable GA-ASI training for the UAS.

**j. Training and currency records.** The training and currency requirements for pilots and observers listed in this section must be documented by GA-ASI in the individual pilot/observers personnel records and made available for inspection upon request by the FAA.



## 5. Equipage.

a. The UAS shall be equipped with an operable Mode S transponder and two-way communications equipment allowing communications between the UA pilot, chase aircraft, observers, all UAS control stations, and Air Traffic Control.

b. The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights.

6. **Electronic Devices.** The use of personal electronic devices (including cell phones) by crew members, other than for UA flight and mission requirements usage is prohibited.

## 7. Communications.

### a. Before UA flights.

(1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.

(2) Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation.

### b. During UA flights.

(1) Upon initial contact with ATC, the PIC must indicate the experimental nature of the aircraft in accordance with 14 CFR § 91.319.

(2) The UA PIC must maintain two-way radio communication with ATC. In addition, if a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way radio communication with the UA PIC and an active listening watch on the assigned ATC frequency. Should the UAS experience communication difficulty or failure, the chase aircraft will assume responsibility for two-way radio communication with ATC for the flight. ***The UAS shall remain within 2.5 nm and 1500' AGL of the El Mirage or Gray Butte airport when conducting local traffic pattern operations and shall remain within the specified observer distances. While in the traffic pattern instantaneous two-way radio communications with ATC are not required.***

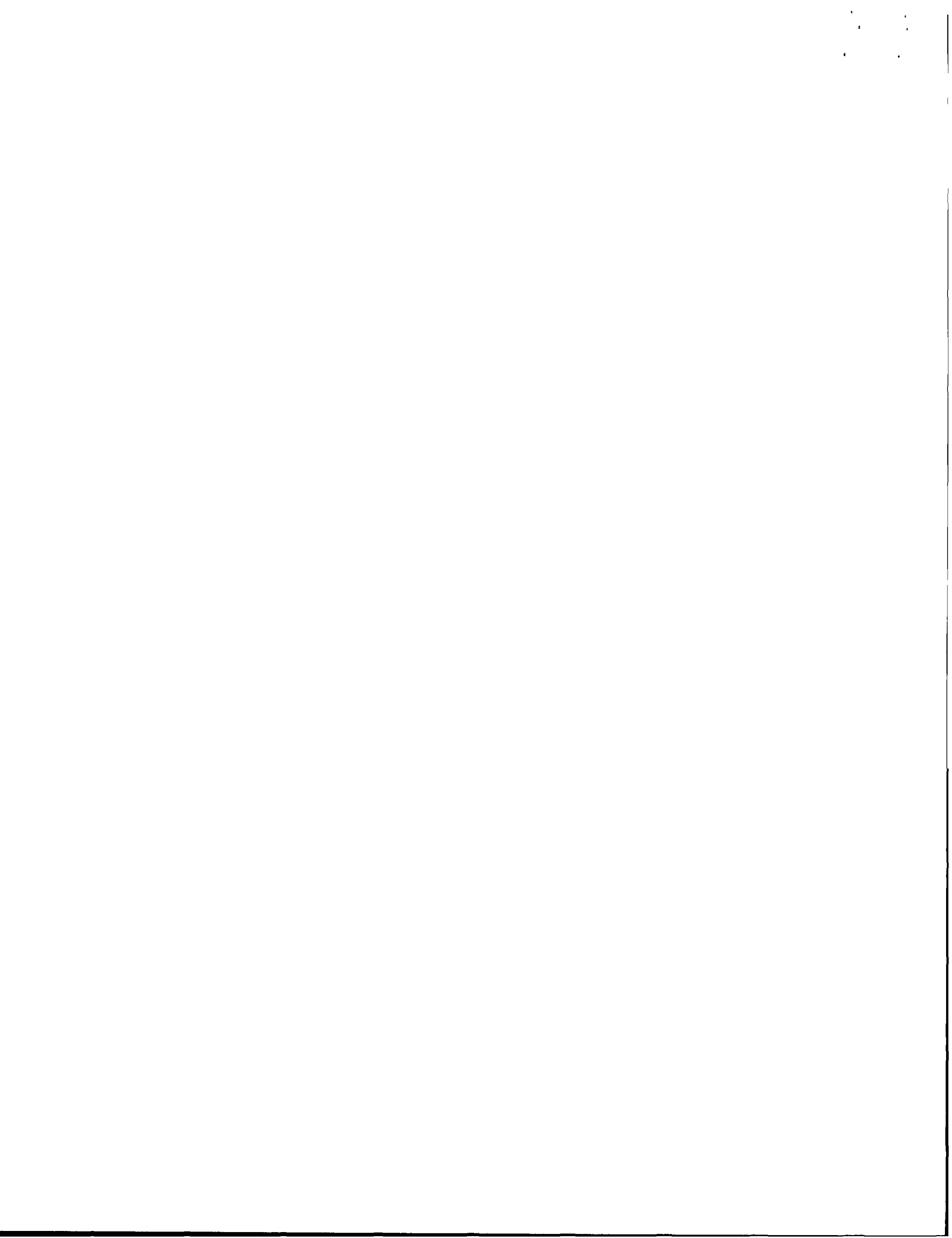
(3) The PIC and observer(s) must maintain two-way communications with each other during all operations.

(4) If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.

(5) ***Prior to flight, the UAS flight operations schedule for N114HK must be provided to Mr. Cotry Shearill, at email [cotry.shearill@faa.gov](mailto:cotry.shearill@faa.gov), at the Van Nuys FSDO.***

## 8. Flight Conditions.

a. **Daylight operations.** All flight operations must be conducted between official sunrise and sunset in visual meteorological conditions (VMC), including cloud clearance



minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

**b. Prohibitions.**

(1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA attitude, an abnormal acceleration, or other flight action not necessary for normal flight. (See § 91.303.)

(2) Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

(3) The UA may not be operated by more than one control station at a time, and the control station may not be used to operate multiple UA.

**c. Transponder requirements.**

(1) The UA must operate an altitude encoding transponder Mode S in accordance with applicable guidelines and procedures.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA unless otherwise directed by ATC.

**d. Transponder failure.**

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

**9. Flight Termination and Lost Link Procedures.**

**a. Flight termination.** In accordance with GA-ASI Program Letter, dated 07/29/2010, flight operations must be discontinued at any point that operation within the approved flight area(s) is breached or the UA can no longer be operated in a safe manner.

**b. Lost link procedures.**

(1) In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the flight test area. The chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

(2) The software for the aircraft lost link timer shall be set to 3 hours. If aircraft control cannot be re-established within 3 hours, the aircraft shall execute a controlled descent to the ground.

**10. Maintenance and Inspection.**

**a. General requirements.** The UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. GA-ASI must establish and maintain aircraft maintenance records (see paragraph 11(d) below).



**b. Inspections.** No person may operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed according to the FAA approved General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 11(d) below.

**c. Authorized inspectors.** Only those individuals trained and authorized by GA-ASI and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

**d. Maintenance and inspection records.** Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:

(1) Maintenance record entries must include a description of the work performed, the date of completion for the work, the UAS total time-in-service, and the name, signature, and certificate number of the person accepting the work performed.

(2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the GA-ASI Inspection and Maintenance Program, and was found to be in a condition for safe operation.*

(3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA accepted revision. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

(4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

**11. Information Reporting.** General Atomics shall provide the following information to [donald.e.grampp@faa.gov](mailto:donald.e.grampp@faa.gov) on a monthly basis.

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

## **12. Revisions and Other Provisions.**

**a. Experimental certificates, program letters, and operating limitations.** The experimental certificate, FAA-accepted GA-ASI program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles Manufacturing Inspection District Office (LA MIDO), in coordination with AIR-200. AIR-200





will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

**b. Certificates of waiver or authorization.** GA-ASI shall immediately notify the Production and Airworthiness Division, AIR-200, and the LA MIDO, if there is any plan for requesting a Certificate of Authorization or Waiver (COA) for UAS operations during the time the experimental certificate is in effect. An entry in the aircraft logbook is required to document that the aircraft flight authority has been changed from the experimental certificate to COA. When COA operations are concluded and the aircraft resumes flying under the experimental certificate, a record entry will be made in the aircraft logbook by an appropriately rated person to document that the aircraft is in a condition for safe operation and appropriately configured.

**c. Amendments and cancellations.** The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

**d. Reviews of revisions.** All revisions to GA-ASI FAA-approved Maintenance and Inspection Program must be reviewed and approved by the Van Nuys Flight Standards District Office.

### **13. UAS Modifications.**

**a. Software and system changes.** All software and system changes will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system changes must be inspected and approved in accordance with General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. All software changes to the aircraft and control station are categorized as major changes, and must be provided in summary form at the time they are incorporated.

**b. Major modifications.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorizations must be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

**c. Submission of modifications.** All information requested must be provided to AIR-200.

End of Limitations





Richard Schoenberger  
Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

8/12/2010  
Date

**I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 08/12/2010 for the purposes of research and development and/or crew training.**

**This special airworthiness certificate is issued for the Altair model UPB97010-1 UAS, serial number AA001, registration number N8172V.**



Applicant (signature)

8/12/2010  
Date

Name (Printed): Gary Bender

Title: Director, Flight Operations

Company: General Atomics, Aeronautical Systems Incorporated

2000

# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
09/30/2007



U.S. Department  
of Transportation  
Federal Aviation  
Administration

## APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

**INSTRUCTIONS** - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.

I. AIRCRAFT DESIGNATION	1. REGISTRATION MARK N8172V		2. AIRCRAFT BUILDER'S NAME (Make) General Atomics, ASI		3. AIRCRAFT MODEL DESIGNATION UPB 97010-1		4. YR. MFR. 2003		5. FAA CODING																																													
	5. AIRCRAFT SERIAL NO. AA001		6. ENGINE BUILDER'S NAME (Make) Honeywell		7. ENGINE MODEL DESIGNATION TPE-331-10Y-511GA																																																	
	8. NUMBER OF ENGINES One (1)		9. PROPELLER BUILDER'S NAME (Make) McCauley		10. PROPELLER MODEL DESIGNATION 3GFR36C606-B		11. AIRCRAFT IS (Check if applicable) IMPORT																																															
II. CERTIFICATION REQUESTED	APPLICATION IS HEREBY MADE FOR: (Check applicable items)																																																					
	A. 1		STANDARD AIRWORTHINESS CERTIFICATE (Indicate Category)				NORMAL		UTILITY		ACROBATIC		TRANSPORT		COMMUTER		BALLOON		OTHER																																			
	B. 7		SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)				UNMANNED AIRCRAFT																																															
			PRIMARY																																																			
			LIGHT-SPORT (Indicate Class)				AIRPLANE		POWER-PARACHUTE		WEIGHT-SHIFT-CONTROL		GLIDER		LIGHTER THAN AIR																																							
			LIMITED																																																			
			PROVISIONAL (Indicate Class)				1. CLASS I		2. CLASS II																																													
			RESTRICTED (Indicate operation(s) to be conducted)				1. AGRICULTURE AND PEST CONTROL		2. AERIAL SURVEY		3. AERIAL ADVERTISING																																											
							4. FOREST (Wildlife Conservation)		5. PATROLLING		6. WEATHER CONTROL																																											
							0. OTHER (Specify)																																															
			EXPERIMENTAL (Indicate operation(s) to be conducted)				1. RESEARCH AND DEVELOPMENT		2. AMATEUR BUILT		3. EXHIBITION																																											
							4. AIR RACING		5. CREW TRAINING		6. MARKET SURVEY																																											
							0. TO SHOW COMPLIANCE WITH THE CFR		7. OPERATING (Primary Category) KIT BUILT AIRCRAFT																																													
							8. OPERATING LIGHT-SPORT		8A. Existing Aircraft without an airworthiness certificate & do not meet § 103.1		8B. Operating Light-Sport Kit-Built		8C. Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190																																									
							1. FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE																																															
						2. EVACUATION FROM AREA OF IMPENDING DANGER																																																
						3. OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT																																																
						4. DELIVERING OR EXPORTING		5. PRODUCTION FLIGHT TESTING																																														
						6. CUSTOMER DEMONSTRATION FLIGHTS																																																
C. 8		MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Limited" as applicable)																																																				
III. OWNER'S CERTIFICATION	A. REGISTERED OWNER (As shown on certificate of aircraft registration)											IF DEALER, CHECK HERE																																										
	NAME General Atomics, Aeronautical Systems Inc.											ADDRESS 14200 Kirkham Way Poway, CA 92064																																										
	B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																																																					
	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.)											AIRWORTHINESS DIRECTIVES (Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)																																										
	AIRCRAFT LISTING (Give page number(s))											SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated)																																										
C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS																																																						
CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417											TOTAL AIRFRAME HOURS 569.7											EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) 0																																
D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101, et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																																																						
DATE OF APPLICATION July 30, 2009											NAME AND TITLE (Print or type) Gary Bender, Director of Flight Operations Facilities											SIGNATURE <i>[Signature]</i>																																
IV. INSPECTION AGENCY VERIFICATION	A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies)																																																					
	14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)											CERTIFICATED MECHANIC (Give Certificate No.)											CERTIFICATED REPAIR STATION (Give Certificate No.)																															
	AIRCRAFT MANUFACTURER (Give name or firm)																																																					
DATE											TITLE											SIGNATURE																																
V. FAA REPRESENTATIVE CERTIFICATION	(Check ALL applicable block items A and B)																																																					
	A. I find that the aircraft described in Section I or VII meets requirements for											THE CERTIFICATE REQUESTED											AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE																															
	B. Inspection for a special permit under Section VII was conducted by:											FAA INSPECTOR											FAA DESIGNER																															
												CERTIFICATE HOLDER UNDER											14 CFR part 65											14 CFR part 121 OR 135											14 CFR part 145									
DATE 30 JUL 2009											DISTRICT OFFICE ANM-108L											DESIGNEE'S SIGNATURE AND NO.											FAA INSPECTOR'S SIGNATURE <i>[Signature]</i> RICHARD SCHOENBERGER																					

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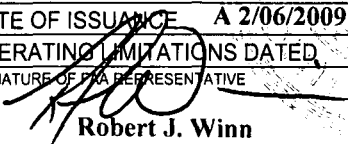
<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER							
	NAME		ADDRESS					
	B. PRODUCTION BASIS (Check applicable item)							
	<input type="checkbox"/> PRODUCTION CERTIFICATE (Give production certificate number) _____							
	<input type="checkbox"/> TYPE CERTIFICATE ONLY							
	<input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM							
C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS								
DATE OF APPLICATION		NAME AND TITLE (Print or Type)		SIGNATURE				
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	A. DESCRIPTION OF AIRCRAFT							
	REGISTERED OWNER		ADDRESS					
	BUILDER (Make)		MODEL					
	SERIAL NUMBER		REGISTRATION MARK					
	B. DESCRIPTION OF FLIGHT							
	FROM		TO					
	VIA		DEPARTURE DATE	DURATION				
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT							
	<input type="checkbox"/>	PILOT	<input type="checkbox"/>	CO-PILOT	<input type="checkbox"/>	FLIGHT ENGINEER	<input type="checkbox"/>	OTHER (Specify)
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:							
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: (Use attachment if necessary)							
	F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.							
DATE		NAME AND TITLE (Print or Type)			SIGNATURE			
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA designee use only)</b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.			G. Statement of Conformity, FAA Form 8130-9 (Attach when required)			
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft (Attach when required)			
	<input type="checkbox"/>	C. Data, Drawings, Photographs, etc. (Attach when required)			I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191</u> CAR _____ (Original Attached)			
	<input checked="" type="checkbox"/>	D. Current Weight and Balance information Available in Aircraft <u>GCS</u>			J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191(a), (b), (f)</u> (Copy Attached)			
	<input type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 (Attach when required)			K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 (Attach when required)			
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records						





UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

# SPECIAL AIRWORTHINESS CERTIFICATE

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development / Crew Training / Market Survey</b>	
<b>B</b>	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>A 2/06/2009</b>	EXPIRY <b>2/05/2010</b>
	OPERATING LIMITATIONS DATED <b>2/06/2009</b>	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Robert J. Winn</b>	DESIGNATION OR OFFICE NO.  <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

<b>A</b>	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
<b>B</b>	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
<b>C</b>	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
<b>D</b>	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
<b>E</b>	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

**SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development / Crew Training / Market Survey</b>	
<b>B</b>	MANU-FACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>7/30/2009</b>	
	EXPIRY <b>7/29/2010</b>	
	OPERATING LIMITATIONS DATED <b>7/30/2009</b>	
	ARE PART OF THIS CERTIFICATE	
<b>E</b>	SIGNATURE OF FAA REPRESENTATIVE	DESIGNATION OR OFFICE NO.
	<b>Richard Schoenberg</b>	<b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).





Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

**Operating Limitations**  
**Experimental: Research and Development, Market Survey,**  
**and/or Crew Training**

<b>REGISTERED OWNER NAME:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.	<b>AIRCRAFT BUILDER:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.
<b>REGISTERED OWNER ADDRESS:</b> 14200 KIRKHAM WAY POWAY, CA 92064	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT DESCRIPTION:</b> ALTAIR UNMANNED AIRCRAFT FIXED WING, TURBO PROP	<b>AIRCRAFT MODEL DESIGNATION:</b> ALTAIR UPB97010-1
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>ENGINE MODEL:</b> HONEYWELL TPE-331-10Y-511GA
<b>YEAR MANUFACTURED:</b> 2003	<b>PROPELLER MODEL:</b> MCCAULEY 3GFR36C606-B

The following conditions and limitations apply to all flight operations for the General Atomics Aeronautical Systems, Inc., (GA-ASI) Altair unmanned aircraft system (UAS) while operating in the National Airspace System (NAS).

**1. General Information.**

**a. Integrated system.** For the purposes of this special airworthiness certificate and operating limitations, the Altair Unmanned Aircraft System (UAS) operated by GA-ASI is considered to be an integrated system. The system is composed of the following:

- (1) Altair unmanned aircraft, model UPB97010-1.
- (2) UAS control station(s), fixed, mobile, ground-based, or airborne.
- (3) Telemetry, launch, and recovery equipment.
- (4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Altair UAS.



(5) Equipment on the ground and in the air used for communication with the chase aircraft, other members of the flight crew, observers, air traffic control (ATC), and other users of the NAS.

**b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules).** Unless otherwise specified in this document, the UA pilot-in-command (PIC) and GA-ASI must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

**c. Operational requirements.**

(1) No person may operate this UAS for other than the purpose of research and development and/or crew training, to accomplish the flight operation outlined in GA-ASI Program Letter dated 7/29/2009, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

(2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

(3) GA-ASI must accumulate at least 50 flight hours of flight time on the UAS before customer crew training is permitted, in accordance with § 21.195(d), Experimental certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

**d. UA condition.** The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

**e. Multiple-purpose operations.** When changing between operating purposes of a multiple purpose certificate, GA-ASI must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

**f. Operation exceptions.** No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

**g. UA markings.**

(1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division, AIR-200.

(2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

**h. Required documentation.** Prior to conducting the initial flight operations, GA-ASI must forward a scanned electronic copy of the Program Letter, and signed copies of the Special Airworthiness Certificate, and Operating Limitations to the following persons by email:

(1) FAA Western Terminal Service Area, Debra Trindle, Air Traffic Representative, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov), telephone (623) 856-9596 Airspace Branch, AWP-520.





(2) Richard Posey, Aviation Safety Inspector, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, telephone (202) 385-6378, email [richard.posey@faa.gov](mailto:richard.posey@faa.gov).

i. **Change in registrant address.** Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

j. **Certificate display and manual availability.** The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, General Rulemaking Procedures, to GA-ASI.

**2. Program Letter.** The Altair Program Letter, dated 7/29/09, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

### **3. Authorized Flight Operations Area.**

a. **General.** All operations will be conducted in accordance with the FAA accepted GA-ASI Flight Operations Procedures, ASI-00009 (Civil), and GA-ASI Ground Operations Procedures, ASI-00056 (Civil).

b. **Description of the authorized flight operations area.** The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

c. **Flight test area.** The flight operations area authorized for the Altair UA will be referred to as the Primary Containment Area (PCA) and is depicted graphically below. Flight operations in the PCA shall be conducted within the defined boundaries at or below 13,000 ft MSL. When operating in a terminal environment, the UA must have line of sight communications. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. The PCA is identified as follows:



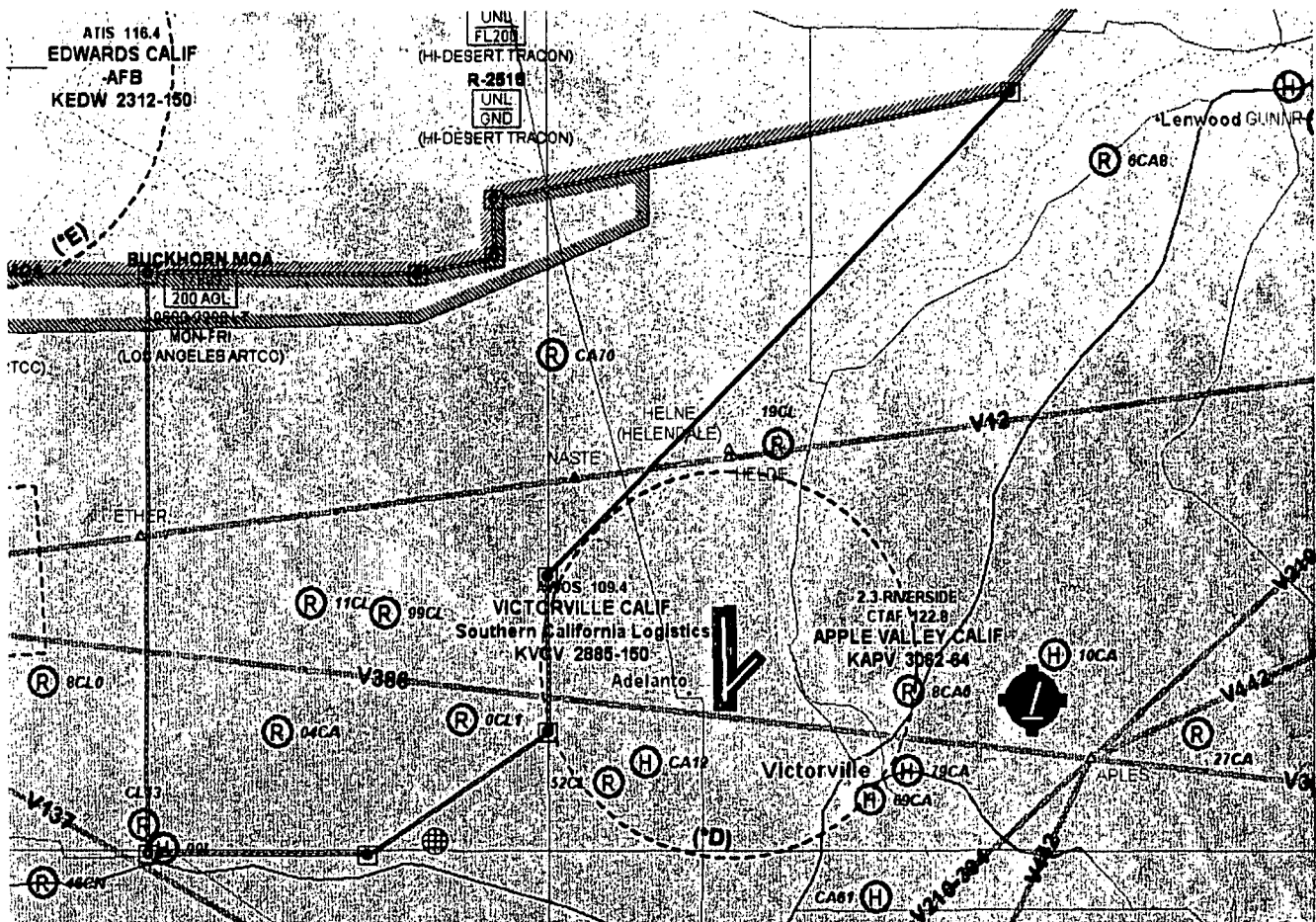


Figure 2: Primary Containment Area

N 34° 30.0'	W 117° 37.0'
N 34° 30.0'	W 117° 45.5'
N 34° 48.0'	W 117° 45.5'
N 34° 48.0'	W 117° 35.0'
N 34° 48.5'	W 117° 32.0'
N 34° 50.3'	W 117° 32.0'
N 34° 53.5'	W 117° 11.9'
N 34° 38.6'	W 117° 30.0'
N 34° 33.8"	W 117° 30.0'

**d. Fuel limitation.** Fuel shall be limited to that necessary to complete the intended mission plus 500 pounds.

**e. Authorized flight times and conditions.** All flight operations must be conducted during daylight hours under visual flight rules (VFR). It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g., spill out), provisions of this experimental certificate shall apply, including



authorization to only operate within the boundaries of the PCA. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

**f. Criteria for remaining in the flight test area.** The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the PCA. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

**g. Incident/accident reporting.** Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AIR-160. AIR-160 can be reached by telephone at 202-385-4636 and fax at 202-385-4631. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to GA-ASI.

#### **4. UA Pilots and Observers.**

##### **a. UA PIC roles and responsibilities.**

(1) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.

(2) The UA PIC must perform crew duties for only one UA at a time.

(3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground.

(4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

##### **b. UA PIC certification and ratings requirements.**

(1) UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

(2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.

##### **c. UA PIC currency, flight review, and training.**

(1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.

(2) The UA PIC must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(3) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.



(4) All UA PICs must have successfully completed applicable GA-ASI company training for the UAS.

(5) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections. GA-ASI shall comply with this requirement no later than 01/01/09.

**d. Supplemental UA pilot roles and responsibilities.**

(1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.

(2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.

(3) A supplemental UA pilot must perform crew duties for only one UA at a time.

**e. Supplemental UA pilot certification.** The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

**f. Supplemental UA pilot currency, flight review, and training.**

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(3) All UA pilots must have successfully completed applicable GA-ASI training for the UAS.

(4) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**g. Observer roles and responsibilities.** The task of the observer is to provide the UA PIC with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

(1) The observer must perform crew duties for only one UA at a time.

(2) At no time will the observer permit the UA to operate beyond the line-of-sight necessary to ensure maneuvering information can be reliably determined.

(3) At no time will the observer conduct his/her duties more than 3.0 statute miles laterally or 3000 ft vertically from the UA.

(4) An observer must maintain visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.





(5) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

(6) Observers must continually scan the airspace for other aircraft that pose a potential conflict.

(7) All flight operations conducted in the flight test area must have an observer to perform traffic avoidance and visual observation to fulfill the see-and-avoid requirement of § 91.113, Right-of-way rules: Except water operations.

#### **h. Observer certification.**

(1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.

(2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

#### **i. Observer training.**

(1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.

(2) All observers must have successfully completed applicable GA-ASI training for the UAS.

**j. Training and currency records.** The training and currency requirements for pilots and observers listed in this section must be documented by GA-ASI in the individual pilot/observers personnel records and made available for inspection upon request by the FAA.

### **5. Equipage.**

**a.** The UAS shall be equipped with an operable Mode S transponder and two-way communications equipment allowing communications between the UA pilot, chase aircraft, observers, all UAS control stations, and Air Traffic Control.

**b.** The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights.

### **6. Communications.**

#### **a. Before UA flights.**

(1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.



(2) Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation.

**b. During UA fights.**

(1) Upon initial contact with ATC, the PIC must indicate the experimental nature of the aircraft in accordance with 14 CFR § 91.319.

(2) The UA PIC must maintain two-way radio communication with ATC. In addition, if a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way radio communication with the UA PIC and an active listening watch on the assigned ATC frequency. Should the UAS experience communication difficulty or failure, the chase aircraft will assume responsibility for two-way radio communication with ATC for the flight. ***The UAS shall remain within 2.5 nm and 1500' AGL of the El Mirage or Gray Butte airport when conducting local traffic pattern operations and shall remain within the specified observer distances. While in the traffic pattern instantaneous two-way radio communications with ATC are not required.***

(3) The PIC and observer(s) must maintain two-way communications with each other during all operations.

(4) If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.

***(5) Prior to flight, the UAS flight operations schedule for N8172V must be provided to Mr. Cotry Shearill, at email [cotry.shearrill@faa.gov](mailto:cotry.shearrill@faa.gov), at the Van Nuys FSDO.***

**9. Flight Conditions.**

**a. Daylight operations.** All flight operations must be conducted between official sunrise and sunset in visual meteorological conditions (VMC), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

**b. Prohibitions.**

(1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA attitude, an abnormal acceleration, or other flight action not necessary for normal flight. (See § 91.303.)

(2) Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

(3) The UA may not be operated by more than one control station at a time, and the control station may not be used to operate multiple UA.

**c. Transponder requirements.**

(1) The UA must operate an altitude encoding transponder Mode S in accordance with applicable guidelines and procedures.



(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA unless otherwise directed by ATC.

**d. Transponder failure.**

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

**10. Flight Termination and Lost Link Procedures.**

**a. Flight termination.** In accordance with GA-ASI Program Letter, dated 07/29/09, flight operations must be discontinued at any point that operation within the approved flight area(s) is breached or the UA can no longer be operated in a safe manner.

**b. Lost link procedures.**

(1) In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the flight test area. The chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

(2) The software for the aircraft lost link timer shall be set to 3 hours. If aircraft control cannot be re-established within 3 hours, the aircraft shall execute a controlled descent to the ground.

**11. Maintenance and Inspection.**

**a. General requirements.** The UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. GA-ASI must establish and maintain aircraft maintenance records (see paragraph 11(d) below).

**b. Inspections.** No person may operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed according to the FAA approved General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 11(d) below.

**c. Authorized inspectors.** Only those individuals trained and authorized by GA-ASI and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

**d. Maintenance and inspection records.** Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:



(1) Maintenance record entries must include a description of the work performed, the date of completion for the work, the UAS total time-in-service, and the name, signature, and certificate number of the person accepting the work performed.

(2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the GA-ASI Inspection and Maintenance Program, and was found to be in a condition for safe operation.*

(3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA accepted revision. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

(4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

**12. Information Reporting.** General Atomics shall provide the following information to [donald.e.grampp@faa.gov](mailto:donald.e.grampp@faa.gov) on a monthly basis.

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

**13. Revisions and Other Provisions.**

a. **Experimental certificates, program letters, and operating limitations.** The experimental certificate, FAA-accepted GA-ASI program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles Manufacturing Inspection District Office (LA MIDO), in coordination with AIR-200. AIR-200 will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

b. **Certificates of waiver or authorization.** GA-ASI shall immediately notify the Production and Airworthiness Division, AIR-200, and the LA MIDO, if there is any plan for requesting a Certificate of Authorization or Waiver (COA) for UAS operations during the time the experimental certificate is in effect. An entry in the aircraft logbook is required to document that the aircraft flight authority has been changed from the experimental certificate to COA. When COA operations are concluded and the aircraft resumes flying under the experimental certificate, a record entry will be made in the aircraft logbook by an appropriately rated person to document that the aircraft is in a condition for safe operation and appropriately configured.





**c. Amendments and cancellations.** The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

**d. Reviews of revisions.** All revisions to GA-ASI FAA-approved Maintenance and Inspection Program must be reviewed and approved by the Van Nuys Flight Standards District Office.

#### **14. UAS Modifications.**

**a. Software and system changes.** All software and system changes will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system changes must be inspected and approved in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. All software changes to the aircraft and control station are categorized as major changes, and must be provided in summary form at the time they are incorporated.

**b. Major modifications.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorizations must be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

**c. Submission of modifications.** All information requested must be provided to AIR-200.

End of Limitations



07/30/2009

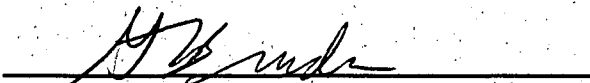


Richard Schoenberger  
Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

7/30/2009  
Date

**I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 7/30/2009 for the purposes of research and development and/or crew training.**

**This special airworthiness certificate is issued for Altair model UPB97010-1 UAS, serial number AA001, registration number N8172V.**



Applicant

Gary Bender

Director, Flight Operations

General Atomics, Aeronautical Systems Incorporated

7/30/09  
Date



Conformity Inspection Record			1. Project Number, TIA/Request Date:		2. SHEET of Sheets 1 of 2	
3. Applicant/Manufacturer: General Atomics Aeronautical Systems, Inc., Gray Butte, CA			4. Beginning Date: 7/30/2009		5. Ending Date: 7/30/2009	
6. Model: Altair			7. Inspected By: Richard Schoenberger (ASI ANM-108L)			
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Determined		13. Comments
				SAT.	UNSAT.	
1	Application for Airworthiness	FAA Form 8130-6	10-04	1		Verified properly formatted document and signature from Gary Bender, Director of Flt Ops. Dated: 7/30/2009 Airframe Hrs: 569.7 Registration #: N8172V Year Built: 2003 S/N: AA001 Model Desc: UPB97010-1 Eng. Mdl: TPE-331-10Y-511GA Prop: McCauley 3GFR3C606
2	Aircraft airworthiness inspection	Altair UAV Serial Number: AA001	6/2003	1		Witnessed functional ground check of flight controls, inspected landing gear assy's, pitot static system, and navigation/strobe lights for operation. Performed visual inspection of FWD and AFT equipage bays with regards to FOD/FOP and routing of wiring harnesses and security of payloads.
3	Propeller Operators manual and Log book	MPC-13		1		Reviewed log book entries and serial number specific documentation. Propeller P/N: P6067599 S/N: 042469 Blade S/N: 1) ZF30059 2) ZF30060 3) ZF30076 Condition Inspection accomplished July 30, 2009 Total Hrs. 44.7
4	Aircraft Flight Log Book			1		Flt #: 142 Dtd: 1-29-08 Hrs.: 569.7



Conformity Inspection Record			1. Project Number, TIA/Request Date:		2. SHEET of Sheets 2 of 2	
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8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Determined		13. Comments
5	Operating Limitations/Experimental-ISSUED	R&D/Crew Training/Market Survey	Dtd: 7/30/2009	1		Issued by the Los Angeles-Manufacturing Inspection District Office and signed by Aviation Safety Inspector: Richard Schoenberger. Counter signed by
						GA-ASI Flight Operations Director: Gary Bender.
6	General Atomics Aeronautical	NASA Altair Software Version Matrix	Rev: "-" Version: 3.3.7	1		Visually verified objective evidence of aircraft software upgrade on
			Dated: 7/28/2009			Ground Control Station display. DGCS: Revised to 3.8.10 DFCS: Revised to 141a
						This software revision reduces the lost link loiter to 3 hours.
7	Aircraft logbook entry		7/30/2009	1		Entry made in UAV logbook after airworthiness inspection of UAS.
						The next condition inspection is due on or before 7/29/2010. Aircraft Maint. Record #159407
						Issued: 7/30/2009 Expires: 7/29/2010
8	Special Airworthiness Certificate	FAA Form 8130-7	(07/04)	1		Signed: Richard Schoenberger (ASI-Mfg)
	LAST ITEM					





# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
09/30/2007

Accepted NV Apr/22/2009

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																								
		1. REGISTRATION MARK <b>N8172V</b>		2. AIRCRAFT BUILDER'S NAME (Make) <b>General Atomics, ASI</b>		3. AIRCRAFT MODEL DESIGNATION <b>UPB 97010-1</b>		4. YR. MFR. <b>2003</b>	FAA CODING																			
		5. AIRCRAFT SERIAL NO. <b>AA001</b>		6. ENGINE BUILDER'S NAME (Make) <b>Honeywell</b>		7. ENGINE MODEL DESIGNATION <b>TPE-331-10Y-511GA</b>																						
		8. NUMBER OF ENGINES <b>One (1)</b>		9. PROPELLER BUILDER'S NAME (Make) <b>McCauley</b>		10. PROPELLER MODEL DESIGNATION <b>X3GFR36C606/X110GFX-0</b>		11. AIRCRAFT IS (Check if applicable) <b>IMPORT</b>																				
<b>II. CERTIFICATION REQUESTED</b>		APPLICATION IS HEREBY MADE FOR: (Check applicable items)																										
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		B. <input checked="" type="checkbox"/> SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)																										
		7. PRIMARY																										
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4. <input checked="" type="checkbox"/> EXPERIMENTAL (Indicate operation(s) to be conducted) <table style="width: 100%; text-align: center;"> <tr> <td><input checked="" type="checkbox"/> 1 RESEARCH AND DEVELOPMENT</td> <td><input type="checkbox"/> 2 AMATEUR BUILT</td> <td><input type="checkbox"/> 3 EXHIBITION</td> </tr> <tr> <td><input type="checkbox"/> 4 AIR RACING</td> <td><input checked="" type="checkbox"/> 5 CREW TRAINING</td> <td><input checked="" type="checkbox"/> 6 MARKET SURVEY</td> </tr> <tr> <td colspan="3"><input type="checkbox"/> 0 TO SHOW COMPLIANCE WITH THE CFR</td> </tr> <tr> <td colspan="3">7. OPERATING (Primary Category) KIT BUILT AIRCRAFT</td> </tr> <tr> <td colspan="3"> <table style="width: 100%; text-align: center;"> <tr> <td>8A</td> <td>Existing Aircraft without an airworthiness certificate &amp; do not meet § 103.1</td> </tr> <tr> <td>8B</td> <td>Operating Light-Sport Kit-Built</td> </tr> <tr> <td>8C</td> <td>Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190</td> </tr> </table> </td> </tr> </table>								<input checked="" type="checkbox"/> 1 RESEARCH AND DEVELOPMENT	<input type="checkbox"/> 2 AMATEUR BUILT	<input type="checkbox"/> 3 EXHIBITION	<input type="checkbox"/> 4 AIR RACING	<input checked="" type="checkbox"/> 5 CREW TRAINING	<input checked="" type="checkbox"/> 6 MARKET SURVEY	<input type="checkbox"/> 0 TO SHOW COMPLIANCE WITH THE CFR			7. OPERATING (Primary Category) KIT BUILT AIRCRAFT			<table style="width: 100%; text-align: center;"> <tr> <td>8A</td> <td>Existing Aircraft without an airworthiness certificate &amp; do not meet § 103.1</td> </tr> <tr> <td>8B</td> <td>Operating Light-Sport Kit-Built</td> </tr> <tr> <td>8C</td> <td>Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190</td> </tr> </table>			8A	Existing Aircraft without an airworthiness certificate & do not meet § 103.1	8B	Operating Light-Sport Kit-Built	8C	Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190
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<input type="checkbox"/> 4 AIR RACING	<input checked="" type="checkbox"/> 5 CREW TRAINING	<input checked="" type="checkbox"/> 6 MARKET SURVEY																										
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C. <input type="checkbox"/> 6 MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)																												
<b>III. OWNER'S CERTIFICATION</b>		A. REGISTERED OWNER (As shown on certificate of aircraft registration) <table style="width: 100%;"> <tr> <td style="width: 50%;">NAME <b>General Atomics, Aeronautical Systems Inc.</b></td> <td style="width: 50%;">IF DEALER, CHECK HERE <input type="checkbox"/></td> </tr> <tr> <td colspan="2">ADDRESS <b>16761 Via Del Campo Ct. San Diego, CA 92127</b></td> </tr> </table>						NAME <b>General Atomics, Aeronautical Systems Inc.</b>	IF DEALER, CHECK HERE <input type="checkbox"/>	ADDRESS <b>16761 Via Del Campo Ct. San Diego, CA 92127</b>																		
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		B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																										
		AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.)			AIRWORTHINESS DIRECTIVES (Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)																							
AIRCRAFT LISTING (Give page number(s))			SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated)																									
<b>IV. INSPECTION AGENCY VERIFICATION</b>		C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS																										
		<input checked="" type="checkbox"/> CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417		TOTAL AIRFRAME HOURS <b>572.8</b>		3. EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) <b>0</b>																						
		D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																										
		DATE OF APPLICATION <b>February 6, 2009</b>		NAME AND TITLE (Print or type) <b>Gary Bender, Director of Flight Operations Facilities</b>		SIGNATURE 																						
<b>V. FAA REPRESENTATIVE CERTIFICATION</b>		A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies.																										
		2. 14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)		3. CERTIFICATED MECHANIC (Give Certificate No.)		6. CERTIFICATED REPAIR STATION (Give Certificate No.)																						
		5. AIRCRAFT MANUFACTURER (Give name or firm)																										
		DATE <b>2/6/09</b>		TITLE <b>ANM-10BL</b>		SIGNATURE 																						
<b>V. FAA REPRESENTATIVE CERTIFICATION</b>		(Check ALL applicable block items A and B)																										
		A. I find that the aircraft described in Section I or VII meets requirements for <table style="width: 100%; text-align: center;"> <tr> <td><input type="checkbox"/> 4</td> <td><input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED</td> </tr> </table>						<input type="checkbox"/> 4	<input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED																			
		<input type="checkbox"/> 4	<input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED																									
		B. Inspection for a special permit under Section VII was conducted by: <table style="width: 100%; text-align: center;"> <tr> <td><input checked="" type="checkbox"/> FAA INSPECTOR</td> <td><input type="checkbox"/> FAA DESIGNEE</td> </tr> <tr> <td>CERTIFICATE HOLDER UNDER</td> <td></td> </tr> </table>						<input checked="" type="checkbox"/> FAA INSPECTOR	<input type="checkbox"/> FAA DESIGNEE	CERTIFICATE HOLDER UNDER																		
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CERTIFICATE HOLDER UNDER																												
DATE <b>2/6/09</b>		DISTRICT OFFICE <b>ANM-10BL</b>		DESIGNEE'S SIGNATURE AND NO. <b>4</b>																								
<b>V. FAA REPRESENTATIVE CERTIFICATION</b>		14 CFR part 65																										
		14 CFR part 121 OR 135																										
<b>V. FAA REPRESENTATIVE CERTIFICATION</b>		14 CFR part 145																										
		FAA INSPECTOR'S SIGNATURE 																										



<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER			
	NAME		ADDRESS	
	B. PRODUCTION BASIS <i>(Check applicable item)</i>			
	<input type="checkbox"/> PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> <input type="checkbox"/> TYPE CERTIFICATE ONLY <input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM			
	C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS			
DATE OF APPLICATION		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE

<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	A. DESCRIPTION OF AIRCRAFT			
	REGISTERED OWNER		ADDRESS	
	BUILDER <i>(Make)</i>		MODEL	
	SERIAL NUMBER		REGISTRATION MARK	
	B. DESCRIPTION OF FLIGHT			
	FROM		TO	
	VIA		DEPARTURE DATE	
			DURATION	
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT			
	<input type="checkbox"/> PILOT	<input type="checkbox"/> CO-PILOT	<input type="checkbox"/> FLIGHT ENGINEER	<input type="checkbox"/> OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:			
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>			
	F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.			
DATE		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE

<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)</b>	X	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.	G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>
	X	B. Current Operating Limitations Attached	H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>
		C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>	
	X	D. Current Weight and Balance information Available in Aircraft	X
		E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>	X
	X	F. This inspection Recorded in Aircraft Records	K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>



UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

**SPECIAL AIRWORTHINESS CERTIFICATE**

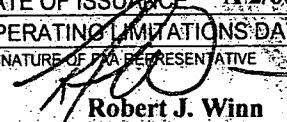
<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development, Crew Training or Market Survey</b>	
<b>B</b>	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>8/11/2008</b>	
	EXPIRY <b>8/10/2009</b>	
	OPERATING LIMITATIONS DATED <b>8/11/2008</b>	
	ARE PART OF THIS CERTIFICATE	
<b>E</b>	SIGNATURE OF FAA REPRESENTATIVE	
	DESIGNATION OR OFFICE NO.	
<b>Robert J. Winn</b>		<b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

<b>A</b>	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
<b>B</b>	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
<b>C</b>	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
<b>D</b>	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
<b>E</b>	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

**SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development / Crew Training / Market Survey</b>	
<b>B</b>	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>2/06/2009</b>	EXPIRY <b>2/05/2010</b>
	OPERATING LIMITATIONS DATED <b>2/06/2009</b>	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Robert J. Winn</b>	DESIGNATION OR OFFICE NO. <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

FAA Form 8130-7 (07/04)

SEE REVERSE SIDE

NSN 0052-00-693-4000

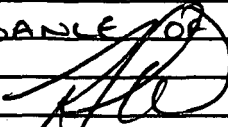






# GENERAL ATOMICS AERONAUTICAL SYSTEMS

## AIRCRAFT MAINTENANCE RECORD

AIRCRAFT/EQUIPMENT S/N N8172V	FLIGHT #	ORIGINATOR	DISC	DATE 2/4/2009	NCR #	FDR #
DISCREPANCY: THE WAS REQUIRES AN FAA AIRWORTHINESS INSPECTION WITH REGARDS TO THE APPLICATION FOR SPECIAL AIRWORTHINESS CERTIFICATE, EXPERIMENTAL, FOR R+D/CREW TRAINING/MARKET SURVEY DATED: 2/6/2009						
CORRECTIVE ACTION: I FIND THIS WAS MEETS THE REQUIREMENTS FOR THE CERTIFICATION REQUESTED AND HAVE ISSUED A SPECIAL AW/CERT DATED: 2/6/2009. THE OPERATION OF THIS WAS IS CONTINGENT UPON GENERAL ATOMICS AERONAUTICAL SYSTEMS INC. COMPLIANCE WITH PROGRAM LETTER DATED: 1/8/2009 AND APPLICABLE OPERATING LIMITATIONS FOR THIS AW/CERT DTD: 2/6/2009						
DISPOSITION: CONT: A NEW CONDITION INSPECTION IS REQUIRED PRIOR TO ISSUANCE OF ANOTHER SPECIAL AW/CERT						
SIGNED:  ROBERT J. WINN ASL/FAA/LA-MIDO						
PARTS REMOVED						
	PART NUMBER	REV	SERIAL NUMBER	NOMENCLATURE	SERIAL TRACK #	HOURS/CYCLES
A						
B						
C						
D						
E						
PARTS INSTALLED						
	PART NUMBER	REV	SERIAL NUMBER	NOMENCLATURE	SERIAL TRACK #	HOURS/CYCLES
A						
B						
C						
D						
E						
AVIONICS HOBBS PRE / POST /	AIRCRAFT CLEARED FOR FLIGHT <input type="checkbox"/> TOOLS AND MAINTENANCE ITEMS ACCOUNTED FOR				ENGINE HOBBS PRE / POST /	
CORRECTED BY	EMPLOYEE NUMBER	DATE		INSPECTED BY	EMPLOYEE NUMBER	
WORK ORDER #	PROJECT NUMBER			LOCATION		
SERIAL NUMBER	SYSTEM/REASON			UP	DOWN	PRTS #
171001				<input type="checkbox"/>	<input type="checkbox"/>	





Los Angeles Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

**Operating Limitations**  
**Experimental: Research and Development, Market Survey,**  
**and/or Crew Training**

<b>REGISTERED OWNER NAME:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.	<b>AIRCRAFT BUILDER:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.
<b>REGISTERED OWNER ADDRESS:</b> 16761 VIA DEL CAMPO CT SAN DIEGO, CA 92127	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT DESCRIPTION:</b> ALTAIR UNMANNED AIRCRAFT FIXED WING, TURBO PROP	<b>AIRCRAFT MODEL DESIGNATION:</b> ALTAIR UPB97010-1
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>ENGINE MODEL:</b> HONEYWELL TPE-331T-10Y-511GA
<b>YEAR MANUFACTURED:</b> 2003	<b>PROPELLER MODEL:</b> MCCAULEY X3GFR36C606/110GFX-0

**The following conditions and limitations apply to all flight operations for the General Atomics Aeronautical Systems, Inc., (GA-ASI) Altair unmanned aircraft system (UAS) while operating in the National Airspace System (NAS).**

**1. General Information.**

**a. Integrated system.** For the purposes of this special airworthiness certificate and operating limitations, the Altair Unmanned Aircraft System (UAS) operated by GA-ASI is considered to be an integrated system. The system is composed of the following:

- (1) Altair unmanned aircraft, model UPB97010-1.
- (2) UAS control station(s), fixed, mobile, ground-based, or airborne.
- (3) Telemetry, launch, and recovery equipment.
- (4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Altair UAS.



(5) Equipment on the ground and in the air used for communication with the chase aircraft, other members of the flight crew, observers, air traffic control (ATC), and other users of the NAS.

**b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules).** Unless otherwise specified in this document, the UA pilot-in-command (PIC) and GA-ASI must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

**c. Operational requirements.**

(1) No person may operate this UAS for other than the purpose of research and development and/or crew training, to accomplish the flight operation outlined in GA-ASI Program Letter dated 01/05/2009, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

(2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

(3) GA-ASI must accumulate at least 50 flight hours under its experimental certificate before customer crew training is permitted, in accordance with § 21.195(d), Experimental certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

**d. UA condition.** The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

**e. Multiple-purpose operations.** When changing between operating purposes of a multiple purpose certificate, GA-ASI must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

**f. Operation exceptions.** No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

**g. UA markings.**

(1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division, AIR-200.

(2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

**h. Required documentation.** Prior to conducting the initial flight operations, GA-ASI must forward a scanned electronic copy of the Program Letter, and signed copies of the Special Airworthiness Certificate, and Operating Limitations to the following persons by email:

(1) FAA Western Terminal Service Area, Debra Trindle, Air Traffic Representative, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov), telephone (623) 856-9596 Airspace Branch, AWP-520.



(2) Richard Posey, Aviation Safety Inspector, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, telephone (202) 385-6378, email [richard.posey@faa.gov](mailto:richard.posey@faa.gov).

**I. Change in registrant address.** Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

**J. Certificate display and manual availability.** The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, General Rulemaking Procedures, to GA-ASI.

**2. Program Letter.** The Altair Program Letter, dated 01/05/09, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

### **3. Authorized Flight Operations Area.**

**a. General.** All operations will be conducted in accordance with the FAA accepted GA-ASI Flight Operations Procedures, ASI-00009 (Civil), and GA-ASI Ground Operations Procedures, ASI-00056 (Civil).

**b. Description of the authorized flight operations area.** The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

**c. Flight test area.** The flight operations area authorized for the Altair UA will be referred to as the Primary Containment Area (PCA) and is depicted graphically below. Flight operations in the PCA shall be conducted within the defined boundaries at or below 13,000 ft MSL. When operating in a terminal environment, the UA must have line of sight communications. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. The PCA is identified as follows:





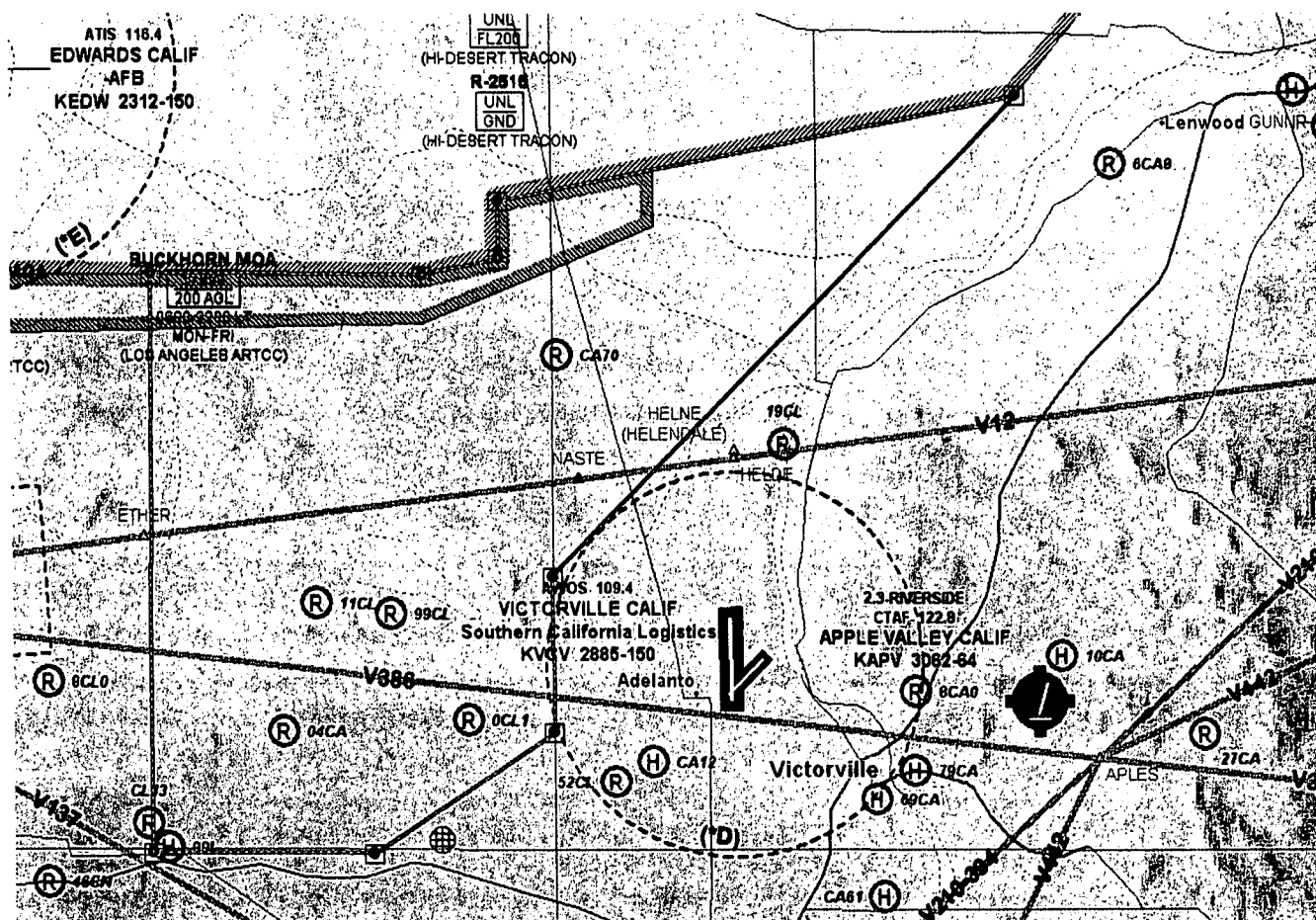


Figure 2: Primary Containment Area

N 34° 30.0'	W 117° 37.0'
N 34° 30.0'	W 117° 45.5'
N 34° 48.0'	W 117° 45.5'
N 34° 48.0'	W 117° 35.0'
N 34° 48.5'	W 117° 32.0'
N 34° 50.3'	W 117° 32.0'
N 34° 53.5'	W 117° 11.9'
N 34° 38.6'	W 117° 30.0'
N 34° 33.8"	W 117° 30.0'

**d. Fuel limitation.** Fuel shall be limited to that necessary to complete the intended mission plus 250 pounds.

**e. Authorized flight times and conditions.** All flight operations must be conducted during daylight hours under visual flight rules (VFR). It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g., spill out), provisions of this experimental certificate shall apply, including



authorization to only operate within the boundaries of the PCA. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

**f. Criteria for remaining in the flight test area.** The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the PCA. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

**g. Incident/accident reporting.** Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AIR-160. AIR-160 can be reached by telephone at 202-385-4636 and fax at 202-385-4651. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to GA-ASI.

#### **4. UA Pilots and Observers.**

##### **a. UA PIC roles and responsibilities.**

(1) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.

(2) The UA PIC must perform crew duties for only one UA at a time.

(3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground.

(4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

##### **b. UA PIC certification and ratings requirements.**

(1) UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

(2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.

##### **c. UA PIC currency, flight review, and training.**

(1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.

(2) The UA PIC must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(3) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.



(4) All UA PICs must have successfully completed applicable GA-ASI company training for the UAS.

(5) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**d. Supplemental UA pilot roles and responsibilities.**

(1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.

(2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.

(3) A supplemental UA pilot must perform crew duties for only one UA at a time.

**e. Supplemental UA pilot certification.** The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

**f. Supplemental UA pilot currency, flight review, and training.**

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(3) All UA pilots must have successfully completed applicable GA-ASI training for the UAS.

(4) Training of UA pilots shall be conducted by certified flight instructors (CFI) or ground instructors (GI). Required training and currency events shall be endorsed by the CFI/GI in company records and the pilot's logbook. Instructors shall follow the guidance specified in 14 CFR 61, Subpart H and Subpart I and shall maintain currency in accordance with these sections.

**g. Observer roles and responsibilities.** The task of the observer is to provide the UA PIC with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

(1) The observer must perform crew duties for only one UA at a time.

(2) At no time will the observer permit the UA to operate beyond the line-of-sight necessary to ensure maneuvering information can be reliably determined.

(3) At no time will the observer conduct his/her duties more than 3.0 statute miles laterally or 3000 ft vertically from the UA.

(4) An observer must maintain visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.



(5) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

(6) Observers must continually scan the airspace for other aircraft that pose a potential conflict.

(7) All flight operations conducted in the flight test area must have an observer to perform traffic avoidance and visual observation to fulfill the see-and-avoid requirement of § 91.113, Right-of-way rules: Except water operations.

#### **h. Observer certification.**

(1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.

(2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

#### **i. Observer training.**

(1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.

(2) All observers must have successfully completed applicable GA-ASI training for the UAS.

**j. Training and currency records.** The training and currency requirements for pilots and observers listed in this section must be documented by GA-ASI in the individual pilot/observers personnel records and made available for inspection upon request by the FAA.

### **5. Equipage.**

a. The UAS shall be equipped with an operable Mode S transponder and two-way communications equipment allowing communications between the UA pilot, chase aircraft, observers, all UAS control stations, and Air Traffic Control.

b. The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights.

### **6. Communications.**

#### **a. Before UA flights.**

(1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.





(2) Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation.

**b. During UA fights.**

(1) Upon initial contact with ATC, the PIC must indicate the experimental nature of the aircraft in accordance with 14 CFR § 91.319.

(2) The UA PIC must maintain two-way radio communication with ATC. In addition, if a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way radio communication with the UA PIC and an active listening watch on the assigned ATC frequency. Should the UAS experience communication difficulty or failure, the chase aircraft will assume responsibility for two-way radio communication with ATC for the flight. ***The UAS shall remain within 2.5 nm and 1500' AGL of the El Mirage or Gray Butte airport when conducting local traffic pattern operations and shall remain within the specified observer distances. While in the traffic pattern instantaneous two-way radio communications with ATC are not required.***

(3) The PIC and observer(s) must maintain two-way communications with each other during all operations.

(4) If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.

***(5) Prior to flight, the UAS flight operations schedule for N8172V must be provided to Mr. Cotry Shearill, at email [cotry.shearill@faa.gov](mailto:cotry.shearill@faa.gov), at the Van Nuys FSDO.***

**7. Flight Conditions.**

**a. Daylight operations.** All flight operations must be conducted between official sunrise and sunset in visual meteorological conditions (VMC), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

**b. Prohibitions.**

(1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA attitude, an abnormal acceleration, or other flight action not necessary for normal flight. (See § 91.303.)

(2) Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

(3) The UA may not be operated by more than one control station at a time, and the control station may not be used to operate multiple UA.

**c. Transponder requirements.**

(1) The UA must operate an altitude encoding transponder Mode S in accordance with applicable guidelines and procedures.



(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA unless otherwise directed by ATC.

**d. Transponder failure.**

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

**8. Flight Termination and Lost Link Procedures.**

**a. Flight termination.** In accordance with GA-ASI Program Letter, dated 01/05/09, flight operations must be discontinued at any point that operation within the approved flight area(s) is breached or the UA can no longer be operated in a safe manner.

**b. Lost link procedures.** In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the flight test area. The chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

**9. Maintenance and Inspection.**

**a. General requirements.** The UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. GA-ASI must establish and maintain aircraft maintenance records (see paragraph 9(d) below).

**b. Inspections.** No person may operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed according to the FAA approved General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 9(d) below.

**c. Authorized inspectors.** Only those individuals trained and authorized by GA-ASI and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

**d. Maintenance and inspection records.** Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:

(1) Maintenance record entries must include a description of the work performed, the date of completion for the work, the UAS total time-in-service, and the name, signature, and certificate number of the person accepting the work performed.

(2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the GA-ASI Inspection and Maintenance Program, and was found to be in a condition for safe operation.*



(3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA accepted revision. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

(4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

**10. Information Reporting.** General Atomics shall provide the following information to [donald.e.grampp@faa.gov](mailto:donald.e.grampp@faa.gov) on a monthly basis.

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

**11. Revisions and Other Provisions.**

**a. Experimental certificates, program letters, and operating limitations.** The experimental certificate, FAA-accepted GA-ASI program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles Manufacturing Inspection District Office (LA MIDO), in coordination with AIR-200. AIR-200 will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

**b. Certificates of waiver or authorization.** GA-ASI shall immediately notify the Production and Airworthiness Division, AIR-200, and the LA MIDO, if there is any plan for requesting a Certificate of Authorization or Waiver (COA) for UAS operations during the time the experimental certificate is in effect. An entry in the aircraft logbook is required to document that the aircraft flight authority has been changed from the experimental certificate to COA. When COA operations are concluded and the aircraft resumes flying under the experimental certificate, a record entry will be made in the aircraft logbook by an appropriately rated person to document that the aircraft is in a condition for safe operation and appropriately configured.

**c. Amendments and cancellations.** The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

**d. Reviews of revisions.** All revisions to GA-ASI FAA-approved Maintenance and Inspection Program must be reviewed and approved by the Van Nuys Flight Standards District Office.



**12. UAS Modifications.**

**a. Software and system changes.** All software and system changes will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system changes must be inspected and approved in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or later FAA approved revision. All software changes to the aircraft and control station are categorized as major changes, and must be provided in summary form at the time they are incorporated.

**b. Major modifications.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorizations must be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

**c. Submission of modifications.** All information requested must be provided to AIR-200.

End of Limitations



Robert J. Winn  
Los Angeles-Manufacturing Inspection District Office  
3960 Paramount Blvd.  
Lakewood, CA 90712

2-6-2009

Date:

I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 2/06/2009 for the purposes of Research and Development, Market Survey and/or Crew Training.

This special airworthiness certificate is issued for Altair model UPB97010-1 UAS, serial number AA001, registration number N8172V.



Applicant (signature)

2/6/2009

Date:

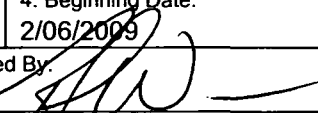
Name: Gary Bender

Title: Director, Flight Operations

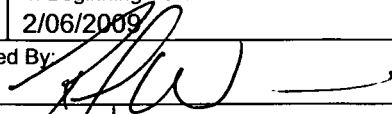
Company: General Atomics, Aeronautical Systems Incorporated





Conformity Inspection Record			1. Project Number, TIA/Request Date:		2. SHEET of Sheets 1 of 2	
3. Applicant/Manufacturer: General Atomics Aeronautical Systems, Inc., Gray Butte, CA			4. Beginning Date: 2/06/2009		5. Ending Date: 2/06/2009	
6. Model: Altair			7. Inspected By: R Winn 			
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Determined		13. Comments
				SAT.	UNSAT.	
1	Application for Airworthiness	FAA Form 8130-6	10-04	1		Verified properly formatted document and signature from Gary Bender, Director of Flt Ops. Dtd: 2/06/09 Airframe Hrs: 572.8 Reg#: N8172V Yr Blt: 2003 S/N #: AA001 Model Desc: UPB97010-1 Eng. Mdl: TPE-331-10Y-511GA Prop: McCauley 3GFR3C606/110GFA-0
2	Aircraft airworthiness inspection	Altair UAV Ser# AA001	6/2003	1		Witnessed functional ground check of flight controls, inspected landing gear assy's, pitot static system, and navigation/strobe lites for operation. Performed visual inspection of FWD and AFT equipage bays with regards to FOD/FOP and routing of wiring harnesses and security of payloads
3	Propeller Operators manual and Log book	MPC-13		1		Reviewed log book entries and serial number specific documentation. Propeller P/N: P6067599 S/N: 042469 Blade S/N: 1) 2F30059 2) 2F30060 3) 2F30076 Condition Inspection accomplished August 6, 2008 Total Hrs. 45.8
4	Aircraft Flight Log Book			1		Flt #: 142 Dtd: 1-29-08 Hrs.: 572.8




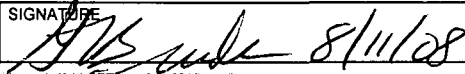
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5	Operating Limitations/Experimental-AMENDED	R&D/Crew Training/Market Survey	Dtd: 2/06/2009	1		Issued by the Los Angeles-Manufacturing Inspection District Office and signed by Aviation Safety Inspector: Robert Winn counter
						signed by GA-ASI Flt. Operations Dir.: Gary Bender
6	Aircraft logbook entry		2/06/2009	1		Entry made in UAV logbook after airworthiness inspection of UAS
						The next condition inspection is due on or before 2/05/2010
7	Special Airworthiness Certificate	FAA Form 8130-7	(10/82)	1		issued: 8/15/07 Expires: 8/14/08 Signed: Robert J. Winn (ASI-Mfg)
	LAST ITEM					
						LAST ITEM



## FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
09/30/2007

Accepted KA Oct/28/2008

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																																																																																																																																																																																																										
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			2	CLASS II																																																																																																																																																																																																										
	3	RESTRICTED (Indicate operation(s) to be conducted)	1	AGRICULTURE AND PEST CONTROL		2	AERIAL SURVEY		3	AERIAL ADVERTISING																																																																																																																																																																																																				
			4	FOREST (Wildlife Conservation)		5	PATROLLING		6	WEATHER CONTROL																																																																																																																																																																																																				
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8	SPECIAL FLIGHT PERMIT (Indicate operation(s) to be conducted, then complete Section VI or VII as applicable on reverse side)	8	OPERATING LIGHT-SPORT	8A	Existing Aircraft without an airworthiness certificate & do not meet § 103.1																																																																																																																																																																																																									
				8B	Operating Light-Sport Kit-Built																																																																																																																																																																																																									
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		1	FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE																																																																																																																																																																																																											
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6	MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)	4	DELIVERING OR EXPORTING		5	PRODUCTION FLIGHT TESTING																																																																																																																																																																																																								
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III. OWNER'S CERTIFICATION	A. REGISTERED OWNER (As shown on certificate of aircraft registration)		IF DEALER, CHECK HERE →																																																																																																																																																																																																											
	NAME General Atomics, Aeronautical Systems Inc.		ADDRESS 16761 Via Del Campo Ct. San Diego, CA 92127																																																																																																																																																																																																											
	B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																																																																																																																																																																																																													
	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.)		✓ AIRWORTHINESS DIRECTIVES (Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)																																																																																																																																																																																																											
IV. INSPECTION AGENCY VERIFICATION	AIRCRAFT LISTING (Give page number(s))		SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated)																																																																																																																																																																																																											
	C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS																																																																																																																																																																																																													
	✓	CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417	TOTAL AIRFRAME HOURS 572.8		3	EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) 51.1																																																																																																																																																																																																								
	D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																																																																																																																																																																																																													
V. FAA REPRESENTATIVE CERTIFICATION	DATE OF APPLICATION August 11, 2008		NAME AND TITLE (Print or type) Gary Bender, Director of Flight Operations Facilities			SIGNATURE 																																																																																																																																																																																																								
	A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies.)																																																																																																																																																																																																													
	2	14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)	3	CERTIFICATED MECHANIC (Give Certificate No.)	6	CERTIFICATED REPAIR STATION (Give Certificate No.)																																																																																																																																																																																																								
	5	AIRCRAFT MANUFACTURER (Give name or firm)																																																																																																																																																																																																												
V. FAA REPRESENTATIVE CERTIFICATION	DATE		TITLE			SIGNATURE																																																																																																																																																																																																								
	(Check ALL applicable block items A and B)																																																																																																																																																																																																													
	A. I find that the aircraft described in Section I or VII meets requirements for		4		X THE CERTIFICATE REQUESTED																																																																																																																																																																																																									
	B. Inspection for a special permit under Section VII was conducted by:		X FAA INSPECTOR		FAA DESIGNEE																																																																																																																																																																																																									
V. FAA REPRESENTATIVE CERTIFICATION	DATE		DISTRICT OFFICE		DESIGNEE'S SIGNATURE AND NO.		FAA INSPECTOR'S SIGNATURE																																																																																																																																																																																																							
	8/11/08		NM-46		4		1																																																																																																																																																																																																							



<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER				
	NAME			ADDRESS	
	B. PRODUCTION BASIS <i>(Check applicable item)</i>				
			PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> _____		
			TYPE CERTIFICATE ONLY		
		APPROVED PRODUCTION INSPECTION SYSTEM			
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS				
	DATE OF APPLICATION		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE
	A. DESCRIPTION OF AIRCRAFT				
	REGISTERED OWNER			ADDRESS	
	BUILDER <i>(Make)</i>			MODEL	
	SERIAL NUMBER			REGISTRATION MARK	
	B. DESCRIPTION OF FLIGHT				
	FROM			TO	
	VIA			DEPARTURE DATE	DURATION
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT				
	PILOT		CO-PILOT	FLIGHT ENGINEER	OTHER <i>(Specify)</i>
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA DESIGNEE use only)</b>	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:				
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>				
	F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.				
	DATE		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA DESIGNEE use only)</b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.			G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>
		C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>			I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section 91.191 <u>(a)(c)(f)</u> CAR _____ <i>(Original Attached)</i>
	<input checked="" type="checkbox"/>	D. Current Weight and Balance information Available in Aircraft <u>GCS</u>			J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 91.191 <u>(a)(c)(f)</u> <i>(Copy Attached)</i>
		E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>			K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records			





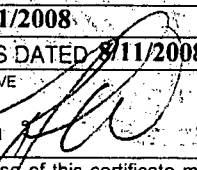
UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION  
**SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION	<b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE	<b>Research and Development, Crew Training or Market Survey</b>	
<b>B</b>	MANUFACTURER	NAME	<b>N/A</b>
		ADDRESS	<b>N/A</b>
<b>C</b>	FLIGHT	FROM	<b>N/A</b>
		TO	<b>N/A</b>
<b>D</b>	N— <b>8172V</b>		SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>		MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>8/15/2007</b>		EXPIRY <b>8/14/2008</b>
	OPERATING LIMITATIONS DATED <b>8/15/2007</b>		ARE A PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Robert J. Winn</b>		DESIGNATION OR OFFICE NO.  <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

A	This airworthiness certificate is issued under the authority of the Federal Aviation Act of 1958 and the Federal Aviation Regulations (FAR).
B	This airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable FAR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable FAR and <i>in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate</i> ; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in FAR Part 21, Section 21.181 or 21.217.

# **SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development, Crew Training or Market Survey</b>	
<b>B</b>	MANU-FACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
<b>C</b>	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
<b>D</b>	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
<b>E</b>	DATE OF ISSUANCE <b>8/11/2008</b>	EXPIRY <b>8/10/2009</b>
	OPERATING LIMITATIONS DATED <b>8/11/2008</b>	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE <b>Robert J. Winn</b> 	DESIGNATION OR OFFICE NO. <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).





Los Angeles Manufacturing Inspection District Office  
3690 Paramount Blvd.  
Lakewood, CA 90712

**Operating Limitations**  
**Experimental: Research and Development, Market Survey,**  
**and/or Crew Training**

<b>REGISTERED OWNER NAME:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.	<b>AIRCRAFT BUILDER:</b> GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.
<b>REGISTERED OWNER ADDRESS:</b> 16761 VIA DEL CAMPO CT SAN DIEGO, CA 92127	<b>AIRCRAFT SERIAL NUMBER:</b> AA001
<b>AIRCRAFT DESCRIPTION:</b> ALTAIR UNMANNED AIRCRAFT FIXED WING, TURBO PROP	<b>AIRCRAFT MODEL DESIGNATION:</b> ALTAIR UPB97010-1
<b>AIRCRAFT REGISTRATION:</b> N8172V	<b>ENGINE MODEL:</b> HONEYWELL TPE-331-10Y-511GA
<b>YEAR MANUFACTURED:</b> 2003	<b>PROPELLER MODEL:</b> MCCAULEY X3GFR36C606 / 110GFA-0

The following conditions and limitations apply to all flight operations for the General Atomics Aeronautical Systems, Inc., (GA-ASI) Altair unmanned aircraft system (UAS) while operating in the National Airspace System (NAS).

**1. General Information.**

**a. Integrated system.** For the purposes of this special airworthiness certificate and operating limitations, the Altair Unmanned Aircraft System (UAS) operated by GA-ASI is considered to be an integrated system. The system is composed of the following:

- (1) ALTAIR unmanned aircraft, model UPB97010-1.
- (2) UAS control station(s), fixed, mobile, ground-based, or airborne.
- (3) Telemetry, launch, and recovery equipment.
- (4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Altair UAS.



(5) Equipment on the ground and in the air used for communication with the chase aircraft, other members of the flightcrew, observers, air traffic control (ATC), and other users of the NAS.

**b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules).** Unless otherwise specified in this document, the UA pilot-in-command (PIC) and GA-ASI must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

**c. Operational requirements.**

(1) No person may operate this UAS for other than the purpose of research and development, market survey, and/or crew training, to accomplish the flight operation outlined in GA-ASI Program Letter dated 6/30/2008, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

(2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

(3) GA-ASI must accumulate at least 50 flight hours under its experimental airworthiness certificate before customer crew training is permitted, in accordance with § 21.195(d), Experimental certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

**d. UA condition.** The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

**e. Multiple-purpose operations.** When changing between operating purposes of a multiple purpose certificate, GA-ASI must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

**f. Operation exceptions.** No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

**g. UA markings.**

(1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division, AIR-200.

(2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

**h. Required documentation.** Prior to conducting the initial flight operations, General Atomics Aeronautical Systems, Inc., must forward a scanned electronic copy of the Program Letter, and signed copies Special Airworthiness Certificate, and Operating Limitations to the following persons by email:

(1) FAA Western Terminal Service Area, Debra Trindle, Air Traffic Representative, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov), telephone (623) 856-9596 Airspace Branch, AWP-520.





(2) Richard Posey, Aviation Safety Inspector, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, telephone (202) 267-9538, email [richard.posey@faa.gov](mailto:richard.posey@faa.gov).

**i. Change in registrant address.** Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

**j. Certificate display and manual availability.** The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, Investigative and Enforcement Procedures, to GA-ASI.

**2. Program Letter.** The GA-ASI Altair Program Letter, dated 6/30/08, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

### **3. Authorized Flight Operations Area.**

**a. Description of the authorized flight operations area.** The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

**b. Flight test area.** The flight operations area authorized for the Altair UA will be referred to as the flight test area, and is depicted graphically below. This area shall be referred to as the "Primary Containment Area." Flight operations in the Primary Containment Area (PCA) shall be conducted at or below 13,000 feet MSL within the boundaries defined below. When operating in a terminal environment, the UA must have line of sight communications. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. The PCA is identified as follows:

- 1) lat. 34°29'47"N, long. 117°45'23"W, to
- 2) lat. 34°37'41"N, long. 117°45'23"W, (7.89 nm) to
- 3) lat. 34°46'21"N, long. 117°42'00"W, (9.10 nm) to
- 4) lat. 34°46'30"N, long. 117°35'03"W, (5.71 nm) to
- 5) lat. 34°49'30"N, long. 117°26'03"W, (13.47 nm) to
- 6) lat. 34°51'17"N, long. 117°26'03"W, (1.78 nm) to
- 7) lat. 34°54'50"N, long. 117°03'30"W, (18.84 nm) to
- 8) lat. 34°35'22"N, long. 117°01'38"W, (19.53 nm) to
- 9) lat. 34°29'50"N, long. 117°29'25"W, (32.85 nm) thence to the point of beginning.



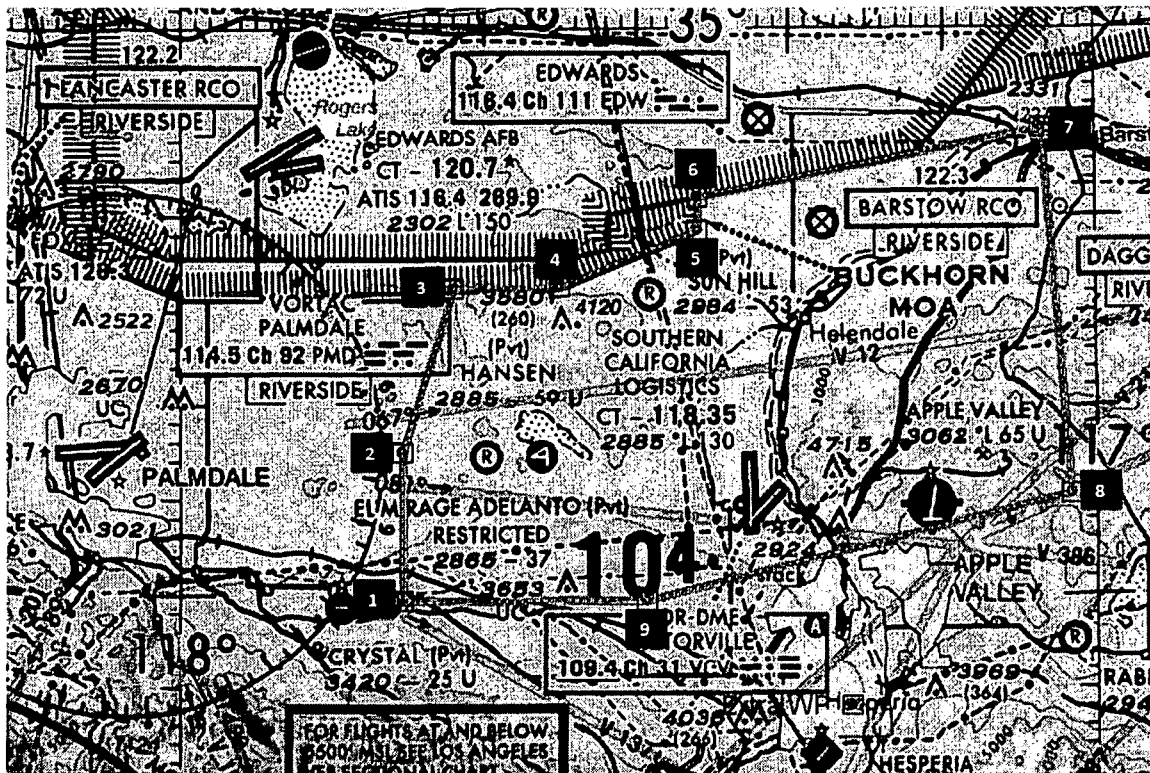


Figure 1: Primary Containment Area (WAC Depiction)

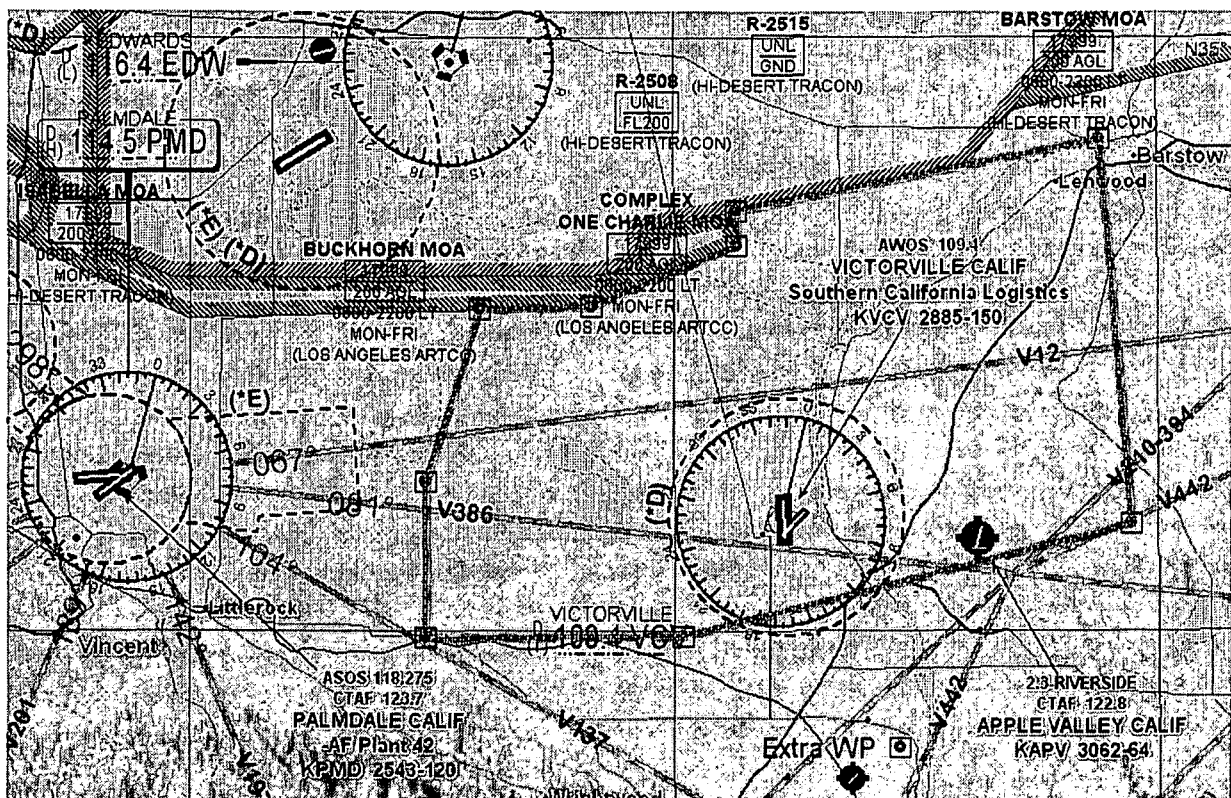


Figure 2: Primary Containment Area



**c. Fuel limitation.** Fuel shall be limited to that necessary to complete the intended mission plus 250 pounds.

**d. Authorized flight times and conditions.** All flight operations must be conducted during daylight hours under visual flight rules (VFR). It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g., spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the PCA. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

**e. Criteria for remaining in the flight test area.** The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the flight test area. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

**f. Incident/accident reporting.** Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AIR-160. AIR-160 can be reached by telephone at 202-385-4636 and fax at 202-385-4651. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: [www.nts.gov](http://www.nts.gov). Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to GA-ASI.

#### **4. UA Pilots and Observers.**

##### **a. UA PIC roles and responsibilities.**

(1) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.

(2) The UA PIC must perform crew duties for only one UA at a time.

(3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground.

(4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

##### **b. UA PIC certification and ratings requirements.**

(1) UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

(2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.



**c. UA PIC currency, flight review, and training.**

(1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.

(2) The UA PIC must maintain currency in unmanned aircraft in accordance with (applicant name) company procedures.

(3) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(4) All UA PICs must have successfully completed applicable GA-ASI company training for the UAS.

**d. Supplemental UA pilot roles and responsibilities.**

(1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.

(2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.

(3) A supplemental UA pilot must perform crew duties for only one UA at a time.

**e. Supplemental UA pilot certification.** The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

**f. Supplemental UA pilot currency, flight review, and training.**

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

(3) All UA pilots must have successfully completed applicable GA-ASI training for the UAS.

**g. Observer roles and responsibilities.** The task of the observer is to provide the UA PIC(s) with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

(1) The observer must perform crew duties for only one UA at a time.

(2) At no time will the observer permit the UA to operate beyond the line-of-sight necessary to ensure maneuvering information can be reliably determined.

(3) At no time will the observer conduct his/her duties more than 3 statute miles laterally or 3000 ft vertically from the UA.

(4) An observer must maintain continuous visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.





(5) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

(6) Observers must continually scan the airspace for other aircraft that pose a potential conflict.

(7) All flight operations conducted in the flight test area must have an observer to perform traffic avoidance and visual observation to fulfill the see-and-avoid requirement of § 91.113, Right-of-way rules: Except water operations.

#### **h. Observer certification.**

(1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.

(2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

#### **i. Observer training.**

(1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in (applicant name) program letter.

(2) All observers must have successfully completed applicable GA-ASI training for the UAS.

**j. Training and currency records.** The training and currency requirements for pilots and observers listed in this section must be documented by GA-ASI in the individual pilot/observers personnel records and made available for inspection upon request by the FAA.

### **5. Equipage.**

**a.** Except as stated in paragraph 6(a)(2), the UAS shall be equipped with an operable Mode-S transponder and two-way communications equipment allowing communications between the UA pilot, chase aircraft, observers, all UAS control stations, and Air Traffic Control.

**b.** The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights.

### **6. Communications.**

#### **a. Before UA flights.**

(1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.



(2) Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation.

**b. During UA fights.**

(1) Upon initial contact with ATC, the PIC must indicate the experimental nature of the aircraft in accordance with 14 CFR § 91.319.

(2) The UA PIC must maintain two-way radio communication with ATC. In addition, if a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way radio communications with ATC and with the UA PIC. ***The UAS shall remain within 2.5 nm and 1500' AGL of the El Mirage or Gray Butte airport when conducting local traffic pattern operations and shall remain within the specified observer distances. While in the traffic pattern instantaneous two-way radio communications with ATC are not required.***

(3) The PIC and observer(s) must maintain two-way communications with each other during all operations.

(4) If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.

***(5) Prior to flight, the UAS flight operations schedule for N8172V must be provided to Mr. Cotry Shearill, at email [cotry.shearill@faa.gov](mailto:cotry.shearill@faa.gov), at the Van Nuys FSDO.***

**8. Flight Conditions.**

**a. Daylight operations.** All flight operations must be conducted between official sunrise and sunset in visual meteorological conditions (VMC), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

**b. Prohibitions.**

(1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA's attitude, an abnormal acceleration, or other flight action not necessary for normal flight. (See § 91.303, Aerobatic flight.) If aerobatic flight is anticipated, it must be thoroughly discussed during the safety evaluation and be appropriately described in the operating limitations.

(2) Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

(3) Each UA must be operated by only one control station at a time. A control station may not be used to operate multiple UAS.

**c. Transponder requirements.**



(1) The UA must operate an altitude encoding transponder (Mode S) in accordance with applicable guidelines and procedures.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

**d. Transponder failure.**

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

**e. Notice to airman.** GA-ASI must request the issuance of a Notice to Airman (NOTAM) through the appropriate Automated Flight Service Station at least 24 hours before flight operation.

**9. Flight Termination and Lost Link Procedures.**

**a. Flight termination.** In accordance with GA-ASI Program Letter, dated 6/30/08, flight operations must be discontinued at any point that operation within the approved flight area(s) is breached or the UA can no longer be operated in a safe manner.

**b. Lost link procedures.** In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the flight test area. The chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

**10. Maintenance and Inspection.**

**a. General requirements.** The UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or FAA later-accepted revision. GA-ASI must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

**b. Inspections.** No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the FAA-accepted General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or FAA later-accepted revision. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 10(d) below.

**c. Authorized inspectors.** Only those individuals trained and authorized by GA-ASI and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

**d. Maintenance and inspection records.** Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:



(1) Maintenance record entries must include a description of the work performed, the date of completion for the work, the UAS's total time-in-service, and the name and signature of the person performing the work.

(2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the GA-ASI Inspection and Maintenance Program, and was found to be in a condition for safe operation.*

(3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or FAA later-accepted revision. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

(4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

**11. Information Reporting.** General Atomics shall provide the following information to [donald.e.grampp@faa.gov](mailto:donald.e.grampp@faa.gov) on a monthly basis.

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

**12. Revisions and Other Provisions.**

**a. Experimental certificates, program letters, and operating limitations.** The experimental certificate, FAA-accepted GA-ASI program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles Manufacturing Inspection District (LA MIDO), in coordination with AIR-200. AIR-200 will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

**b. Certificates of waiver or authorization.** GA-ASI shall notify the LA-MIDO and AIR-200 if the UA listed in these operating limitations is intended to be flown under a Certificate of Waiver or Authorization (COA) during the effective period of the experimental certificate.

**c. Amendments and cancellations.** The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

**d. Reviews of revisions.** All revisions to GA-ASI FAA-approved Maintenance and Inspection Program must be reviewed and approved by the Van Nuys Flight Standards District Office.





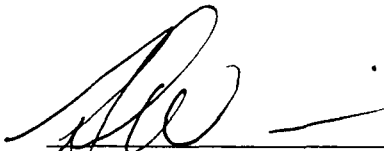
**13. UAS Modifications.**

**a. Software and system changes.** All software and system changes will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system changes must be inspected and approved in accordance with the General Atomics Altair Inspection and Maintenance Program ASI-01909-WC2 dated 06/27/07 and ASI-00992, or FAA later-accepted revision. All software changes to the aircraft and control station are categorized as major changes, and must be provided in summary form at the time they are incorporated.

**b. Major modifications.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorizations must be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

**c. Submission of modifications.** All information requested must be provided to AIR-200.

-----End of Limitations-----




Robert J. Winn  
Los Angeles Manufacturing Inspection District Office  
3690 Paramount Blvd.  
Lakewood, CA 90712

8-11-08  
Date:

**I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 08/11/08, for the purposes of research and development, market survey, and/or crew training, .**

**This special airworthiness certificate is issued for Altair model of UPB97010-1 UAS, serial number AA001, registration number N8172V.**



Applicant (signature)

8/11/08  
Date:

Name (Printed): Gary Bender

Title: Flight Operations, Director

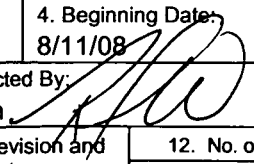
Company: General Atomics Aeronautical Systems Inc.





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Conformity Inspection Record			1. Project Number, TIA/Request Date:		2. SHEET of Sheets 1 OF 2	
3. Applicant/Manufacturer: General Atomics Aeronautical Systems, Inc., Gray Butte, CA			4. Beginning Date: 8/11/08		5. Ending Date: 8/11/08	
6. Model: Altair			7. Inspected By: R Winn 			
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Determined		13. Comments
				SAT.	UNSAT.	
1	Application for Airworthiness	FAA Form 8130-6	10-04	1		Verified properly formatted document and signature from Gary Bender, Director of Flt Ops. Dtd: 8/11/08 Airframe Hrs: 572.8 Reg#: N8172V Yr Blt: 2003 S/N #: AA001 Model Desc: UPB97010-1 Eng. Mdl: TPE-331-10Y-511GA Prop: McCauley 3GFR3C606/110GFA-0
2	Propeller Operators manual and Log book	MPC-13		1		Reviewed log book entries for accuracy and serial number specific documentation. Propeller P/N: P6067599 S/N: 042469 Blade S/N: 1) 2F30059 2) 2F30060 3) 2F30076 Condition Inspection accomplished August 6, 2008 Total Hrs. 45.8
4	Aircraft Flight Log Book			1		Flt #: 142 Dtd: 1-29-08 Hrs.: 572.8
5	Aircraft Discrepancy Logbook			1		10 open Aircraft Maintenance Records (AMR) to facilitate FAA inspection
6	Operating Limitations/Experimental	R&D/Crew Training/Market Survey	Dtd: 8/11/08	1		Issued by the Los Angeles-Manufacturing Inspection District
						Office and signed by Aviation Safety Inspector: Robert Winn counter
						signed by GA-ASI Flt. Operations Dir.: Gary Bender









78172 ✓

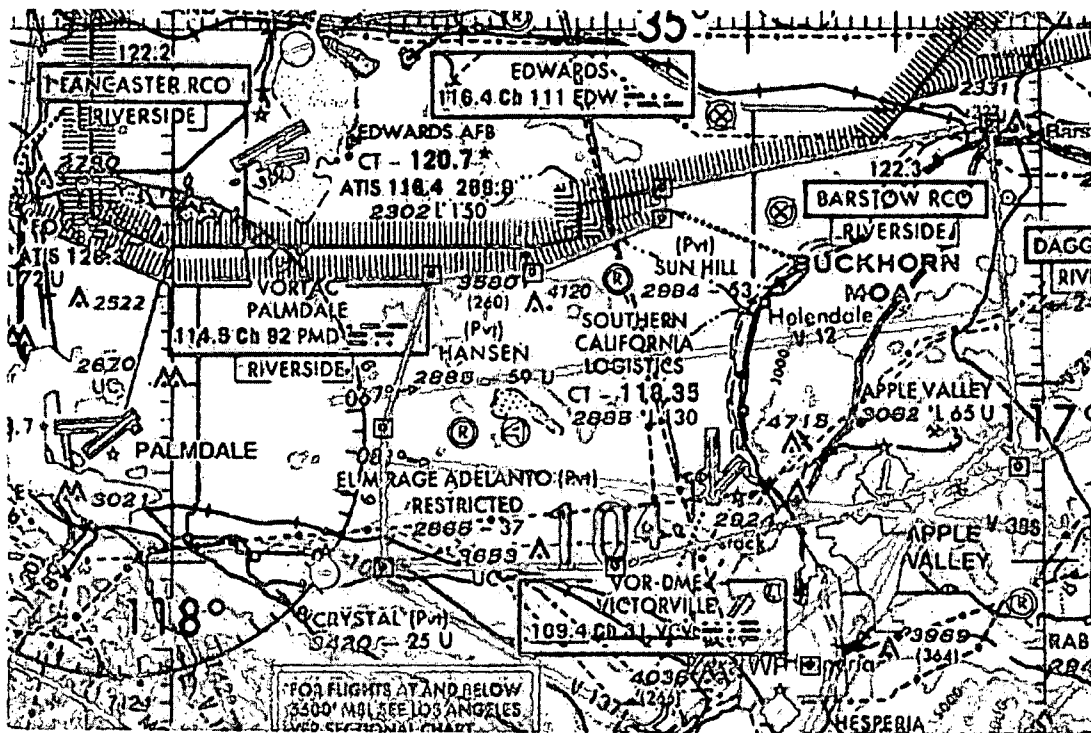


Figure 1: Primary Containment Area (WAC Depiction)

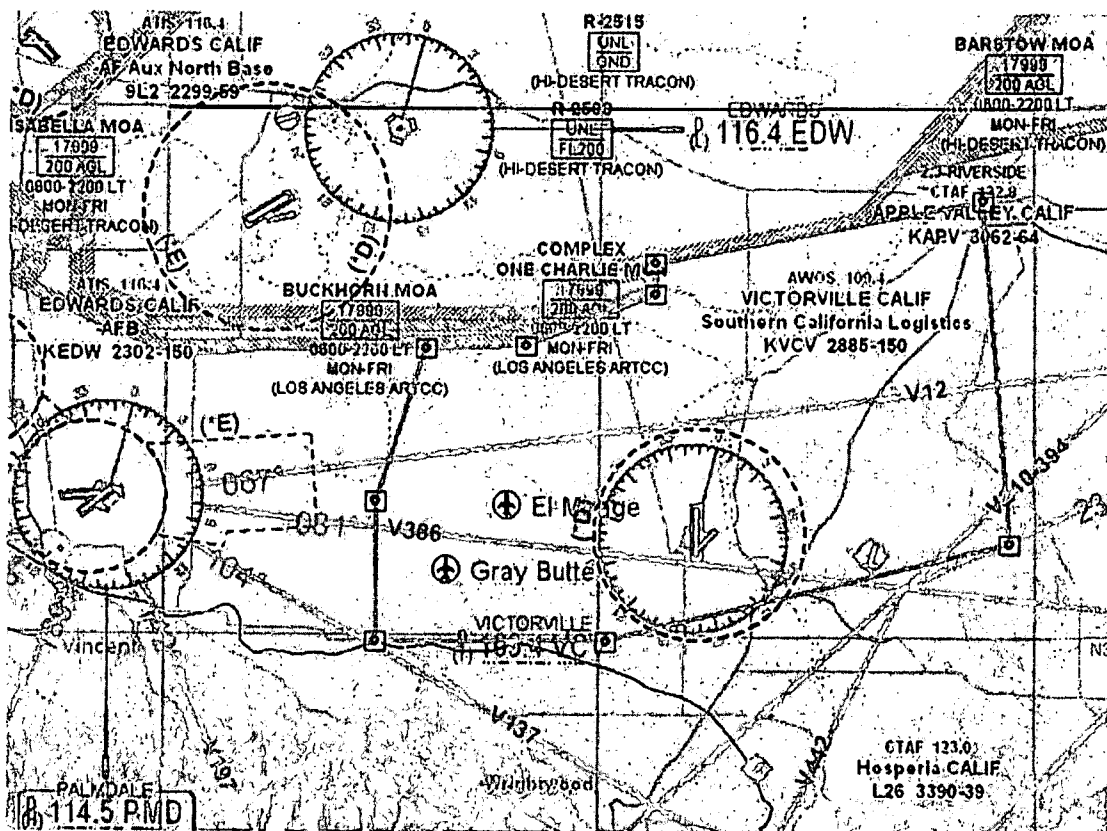


Figure 2: Primary Containment Area



spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the Primary Containment Area. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

c. Flight operations in the Primary Containment Area shall be conducted at or below 13,000 feet MSL within the boundaries defined below. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. When operating in a terminal environment, the UA must have line of sight communications.

d. Beginning at:

lat. 34°29'47"N, long. 117°45'23"W, to  
 lat. 34°37'41"N, long. 117°45'23"W, (7.89 nm) to  
 lat. 34°46'21"N, long. 117°42'00"W, (9.10 nm) to  
 lat. 34°46'30"N, long. 117°35'03"W, (5.71 nm) to  
 lat. 34°49'30"N, long. 117°26'03"W, (13.47 nm) to  
 lat. 34°51'17"N, long. 117°26'03"W, (1.78 nm) to  
 lat. 34°54'50"N, long. 117°03'30"W, (18.84 nm) to  
 lat. 34°35'22"N, long. 117°01'38"W, (19.53 nm) to  
 lat. 34°29'50"N, long. 117°29'25"W, (32.85 nm) thence to the point of  
 beginning (13.13 nm).

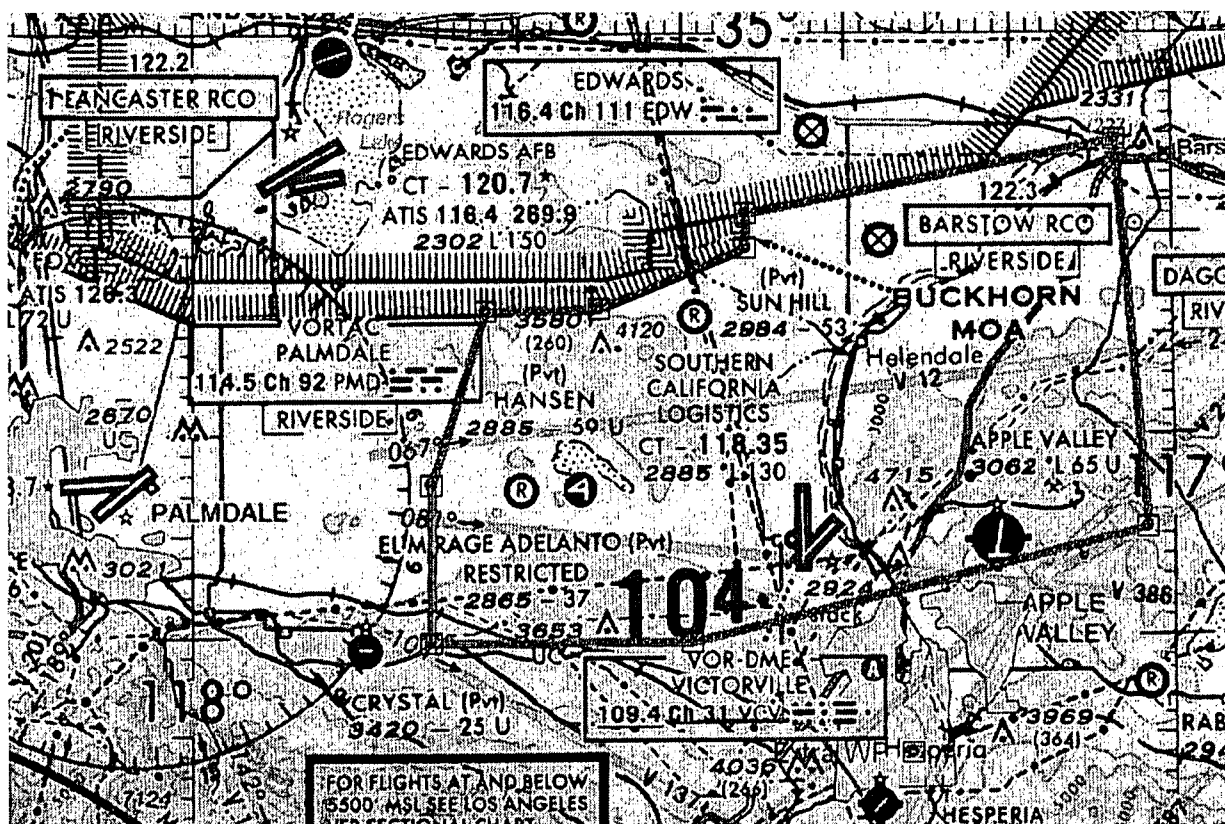


Figure 1: Primary Containment Area (WAC Depiction)



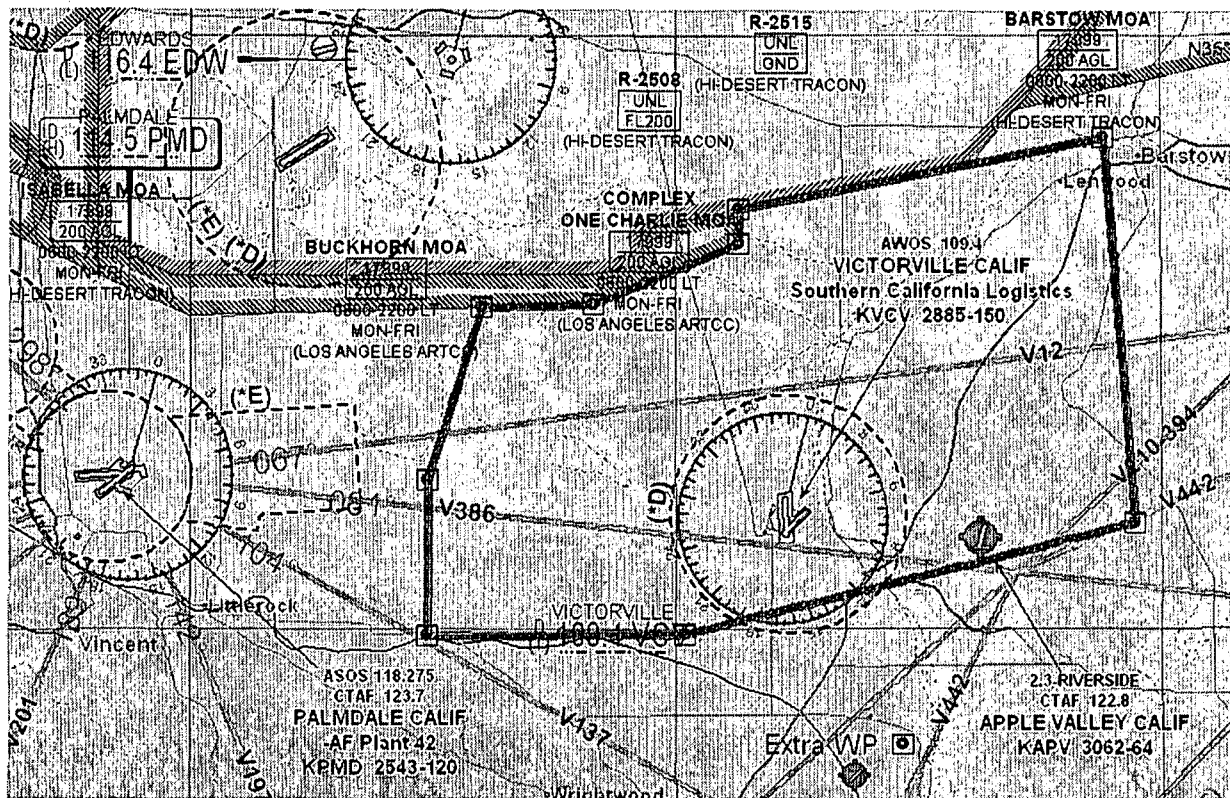


Figure 2: Primary Containment Area

e. The PIC shall ensure that all UA flight operations remain within the lateral and vertical boundaries of the Primary Containment Area or any SUA approved by the using agency. Furthermore, the PIC shall take into account all factors that may affect the capability of remaining within the containment areas. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

f. Incident / Accident Reporting. Any incident / accident and any flight operation that transgresses the lateral or vertical boundaries of the Primary Containment Areas or any SUA shall be reported to the FAA, AIR-160 Manager, as soon as practicable, but always within 24 hours. Accidents shall be reported to the National Transportation Safety Board per instructions contained on the NTSB website: [www.nts.gov](http://www.nts.gov). The AIR-160 Manager can be reached by phone at 202-385-4636, or by fax at 202-385-4651. The point of contact is Mr. Doug Davis. The report may be provided by fax or by e-mail to [Kenneth.d.davis@faa.gov](mailto:Kenneth.d.davis@faa.gov). Further flight operations shall not be conducted until the incident / accident is reviewed by ATO, AFS, and AIR-160. All UAS operations will stand down until a review of the incident is conducted by AFS or ATO and authorization to resume operations is received.

g. Further flight operations shall not be conducted until the incident is reviewed by AIR-160, and authorization to resume operations is received.



# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
09/30/2007

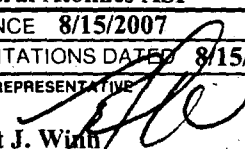
 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.																			
		1. REGISTRATION MARK <b>N8172V</b>		2. AIRCRAFT BUILDER'S NAME (Make) <b>General Atomics, ASI</b>		3. AIRCRAFT MODEL DESIGNATION <b>UPB 97010-1</b>		4. YR. MFR. <b>2003</b>	FAA CODING <b>0610002</b>														
		5. AIRCRAFT SERIAL NO. <b>AA001</b>		6. ENGINE BUILDER'S NAME (Make) <b>Honeywell</b>		7. ENGINE MODEL DESIGNATION <b>TPE-331-10Y-511GA</b>		8. AIRCRAFT IS (Check if applicable) <b>33909</b>															
		8. NUMBER OF ENGINES <b>One (1)</b>		9. PROPELLER BUILDER'S NAME (Make) <b>McCauley</b>		10. PROPELLER MODEL DESIGNATION <b>X3GFR36C606/X110GFX-0</b>		11. AIRCRAFT IS (Check if applicable) <b>IMPORT</b>															
II. CERTIFICATION REQUESTED		APPLICATION IS HEREBY MADE FOR: (Check applicable items)																					
		A 1		STANDARD AIRWORTHINESS CERTIFICATE (Indicate Category)		NORMAL		UTILITY		ACROBATIC		TRANSPORT		COMMUTER		BALLOON		OTHER					
		B		<input checked="" type="checkbox"/>		SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)																	
		7		<input type="checkbox"/>		PRIMARY																	
		9		<input type="checkbox"/>		LIGHT-SPORT (Indicate Class)		AIRPLANE		POWER-PARACHUTE		WEIGHT-SHIFT-CONTROL		GLIDER		LIGHTER THAN AIR							
		2		<input type="checkbox"/>		LIMITED																	
		5		<input type="checkbox"/>		PROVISIONAL (Indicate Class)		1		CLASS I		2		CLASS II									
		3		<input type="checkbox"/>		RESTRICTED (Indicate operation(s) to be conducted)		1		AGRICULTURE AND PEST CONTROL		2		AERIAL SURVEY		3		AERIAL ADVERTISING					
								4		FOREST (Wildlife Conservation)		5		PATROLLING		6		WEATHER CONTROL					
								0		OTHER (Specify)													
		4		<input checked="" type="checkbox"/>		EXPERIMENTAL (Indicate operation(s) to be conducted)		1		<input checked="" type="checkbox"/>		RESEARCH AND DEVELOPMENT		2		AMATEUR BUILT		3		EXHIBITION			
								4		AIR RACING		5		<input checked="" type="checkbox"/>		CREW TRAINING		6		<input checked="" type="checkbox"/>		MARKET SURVEY	
								0		TO SHOW COMPLIANCE WITH THE CFR													
								8		OPERATING LIGHT-SPORT		8A		Existing Aircraft without an airworthiness certificate & do not meet § 103.1									
												8B		Operating Light-Sport Kit-Built									
										8C		Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190											
						1		FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE															
						2		EVACUATION FROM AREA OF IMPENDING DANGER															
						3		OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT															
						4		DELIVERING OR EXPORTING		5		PRODUCTION FLIGHT TESTING											
						6		CUSTOMER DEMONSTRATION FLIGHTS															
C 6		<input type="checkbox"/>		MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)																			
III. OWNER'S CERTIFICATION		A. REGISTERED OWNER (As shown on certificate of aircraft registration)						IF DEALER, CHECK HERE															
		NAME <b>General Atomics, Aeronautical Systems Inc.</b>						ADDRESS <b>16761 Via Del Campo Ct. San Diego, CA 92127</b>															
		B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)																					
		AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.)						<input checked="" type="checkbox"/> AIRWORTHINESS DIRECTIVES (Check if all applicable AD's are compiled with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)															
		AIRCRAFT LISTING (Give page number(s))						SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated)															
IV. INSPECTION AGENCY VERIFICATION		C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS																					
		<input checked="" type="checkbox"/>		CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417		TOTAL AIRFRAME HOURS <b>521.7</b>				3		EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) <b>130.6</b>											
		D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.																					
		DATE OF APPLICATION <b>August 14, 2007</b>				NAME AND TITLE (Print or type) <b>Gary Bender, Director of Flight Operations Facilities</b>						SIGNATURE 											
		A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies.																					
V. FAA REPRESENTATIVE CERTIFICATION		2		14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)		3		CERTIFICATED MECHANIC (Give Certificate No.)		6		CERTIFICATED REPAIR STATION (Give Certificate No.)											
		5		AIRCRAFT MANUFACTURER (Give name or firm)																			
		DATE		TITLE				SIGNATURE															
VI. FAA REPRESENTATIVE CERTIFICATION		(Check ALL applicable block items A and B)																					
		A. I find that the aircraft described in Section I or VII meets requirements for										<input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED											
		B. Inspection for a special permit under Section VII was conducted by:										<input checked="" type="checkbox"/> AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE											
		DATE		DISTRICT OFFICE		DESIGNEE'S SIGNATURE AND NO.		1		FAA INSPECTOR'S SIGNATURE		14 CFR part 65		14 CFR part 121 OR 135		14 CFR part 145							
		<b>8-15-07 LA-M100</b>		<b>4</b>				<b>1</b>															





<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER							
	NAME		ADDRESS					
	B. PRODUCTION BASIS <i>(Check applicable item)</i>							
	<input type="checkbox"/> PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> _____ <input type="checkbox"/> TYPE CERTIFICATE ONLY <input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM							
	C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS							
DATE OF APPLICATION		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE				
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	A. DESCRIPTION OF AIRCRAFT							
	REGISTERED OWNER		ADDRESS					
	BUILDER <i>(Make)</i>		MODEL					
	SERIAL NUMBER		REGISTRATION MARK					
	B. DESCRIPTION OF FLIGHT							
	FROM		TO					
	VIA		DEPARTURE DATE	DURATION				
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT							
	<input type="checkbox"/>	PILOT	<input type="checkbox"/>	CO-PILOT	<input type="checkbox"/>	FLIGHT ENGINEER	<input type="checkbox"/>	OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:							
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>							
	F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.							
	DATE		NAME AND TITLE <i>(Print or Type)</i>		SIGNATURE			
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)</b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.			G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached			H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>			I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>§21.191(a)(2)(F)</u> CAR <u>(F)</u> (Original Attached)			
	<input checked="" type="checkbox"/>	D. Current Weight and Balance information Available in Aircraft <u>GCS</u>			J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>§21.191(a)(2)(F)</u> (Copy Attached)			
	<input checked="" type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>			K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>			
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records						



UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION <b>SPECIAL AIRWORTHINESS CERTIFICATE</b>			
A	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>		
	PURPOSE <b>Research and Development, Crew Training or Market Survey</b>		
B	MANU-FACTURER	NAME	N/A
		ADDRESS	N/A
C	FLIGHT	FROM	N/A
		TO	N/A
D	N- <b>8172V</b>		SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>		MODEL <b>ALTAIR UPB97010-1</b>
E	DATE OF ISSUANCE <b>8/15/2007</b>		EXPIRY <b>8/14/2008</b>
	OPERATING LIMITATIONS DATED <b>8/15/2007</b>		ARE A PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  <b>Robert J. Winn</b>		DESIGNATION OR OFFICE NO. <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA FORM 8130-7 (10/82)

SEE REVERSE SIDE



ASI-00991

ASI-00992



**GENERAL ATOMICS AERONAUTICAL SYSTEMS**

# **ALTAIR MAINTENANCE AND INSPECTION PROGRAM**

**PREPARED BY:**

**General Atomics Aeronautical Systems, Inc. (GA-ASI)  
16761 Via Del Campo Court  
San Diego, CA 92127-1713**

**USE AND DISCLOSURE OF DATA  
GA-ASI PROPRIETARY**

The information contained in this document is the property of General Atomics Aeronautical Systems, Inc. The submission of the information contained herein to any government agency shall not be deemed to constitute public disclosure or authorization to other parties.

GA-ASI PROPRIETARY INFORMATION



# Registration Mark: N8172V

Date: 05-Aug-05

Part#: UPB97010-1

**AltAir Aircraft - UPB97010-1**
 **GENERAL ATOMICS  
AERONAUTICAL SYSTEMS**

SN: AA001

Avionics Hobbs: 1040.2

Total Flights: 69

Total Landings: 73

Engine Hobbs: 414.0

Total Flight Hours: 306.9

Total Gear Cycles: 67

Engine SN: P-121002C

	NOMENCLATURE	Initial Increment		Prior Service Hours	Installed/ Last Completed	Time/ Cycles Next Due	Total Service Hours/ Cycles	Time/ Cycles Remaining
	New Airframe Checklist	<25	EH					
	Engine Overhaul Hot Section	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Engine Complete Overhaul	4000	FH	0.0	0.0	4000.0	306.9	3693.1
	100 Hour Engine/Airframe Inspection	100	FH	0.0	287.4	387.4	19.5	80.5
	200 Hour Engine/Airframe Inspection	200	FH	0.0	191.4	391.4	115.5	84.5
	400 Hour Engine/Airframe Inspection	400	FH	0.0	0.0	400.0	306.9	93.1
	800 Hour Oil Change	800	FH	0.0	287.0	1087.0	19.9	780.1
	Annual Inspection *	1	YR	N/A	07/01/2004	8/1/2005	400	
SN 3014	Battery 1 Reconditioning	28	DA	N/A				
SN 3015	Battery 2 Reconditioning	28	DA	N/A				
SN 3061	Battery 3 Reconditioning	28	DA	N/A				
SN 3060	Battery 4 Reconditioning	28	DA	N/A				
SN 3078	Left Aileron Servo Inboard	3300	FH	0.0	268.2	3568.2	38.7	3261.3
SN 3004	Left Aileron Servo Outboard	3300	FH	0.0	268.2	3568.2	38.7	3261.3
SN 3025	Right Aileron Servo Inboard	3300	FH	0.0	3.3	3303.3	303.6	2996.4
SN 3010	Right Aileron Servo Outboard	3300	FH	0.0	268.2	3568.2	38.7	3261.3
SN 3101	Left Brake Servo	500	FH	0.0	0.0	500.0	306.9	193.1
SN 3104	Right Brake Servo	500	FH	0.0	0.0	500.0	306.9	193.1
SN 3024	Left Flap Servo Inboard	1000	FH	0.0	268.2	1268.2	38.7	961.3
SN 3026	Left Flap Servo Outboard	1000	FH	0.0	268.2	1268.2	38.7	961.3
SN 3056	Right Flap Servo Inboard	1000	FH	0.0	268.2	1268.2	38.7	961.3
SN 3023	Right Flap Servo Outboard	1000	FH	0.0	268.2	1268.2	38.7	961.3
SN 3014	MLG Retract Servo, Left	75	CY	0	0	75	67	8
SN 3015	MLG Retract Servo, Right	75	CY	0	0	75	67	8
SN 3013	Nose Gear Retract Servo	75	CY	0	0	75	67	8
SN 3051	Left Tail Servo Inboard	3300	FH	0.0	265.6	3565.6	41.3	3258.7
SN 3050	Left Tail Servo Outboard	3300	FH	0.0	265.6	3565.6	41.3	3258.7
SN 3007	Rudder Servo	3300	FH	0.0	268.2	3568.2	38.7	3261.3
SN 3053	Right Tail Servo Inboard	3300	FH	0.0	265.6	3565.6	41.3	3258.7
SN 3056	Right Tail Servo Outboard	3300	FH	0.0	265.6	3565.6	41.3	3258.7
SN 3013	Steering Servo	200	FH	0.0	203.1	403.1	103.8	96.2
	Steering Servo Belt	200	FH	0.0	203.1	403.1	103.8	96.2
SN 3098	Power Servo	500	FH	0.0	0.0	500.0	306.9	193.1
SN 3088	Speed Servo	500	FH	0.0	0.0	500.0	306.9	193.1
SN 3100	Stop/Feather Servo	500	FH	0.0	0.0	500.0	306.9	193.1
	Power Servo Control Cable	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Speed Servo Control Cable	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Stop/Feather Servo Control Cable	2000	FH	0.0	0.0	2000.0	306.9	1693.1
SN 011915	McCauley Propeller	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Primary Fuel Pump #1 Brushless	3300	FH	0.0	0.0	3300.0	306.9	2993.1
	Primary Fuel Pump #2 Brushless	3300	FH	0.0	0.0	3300.0	306.9	2993.1
	Fuel Flow Meter	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Startlite Oil Lines	2000	FH	0.0	0.0	2000.0	306.9	1693.1
	Generator	400	FH	0.0	306.9	706.9	0.0	400.0

\* Air data and transponder tests are performed during the Annual Inspection to comply with FAR 91.411 and 91.413, which calls out a 24 month requirement.

Engine Installed Hobbs: 0.0

**EXAMINED AND ACCEPTED  
SIGNED** *Cathy Sheail* *steph*  
*up-01*





ASI-01909-WC2

INSERT LATEST CHANGED CARDS. DESTROY SUPERSEDED CARDS.

## LIST OF EFFECTIVE CARDS

NOTE The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the card. Changes to illustrations are indicated by shaded or screened areas, or by miniature pointing hands.

Dates of issue for original and changed pages are:

Original.....0 ..... 25 JUNE 2007

TOTAL NUMBER OF CARDS IN THIS PUBLICATION IS 42 CONSISTING OF THE FOLLOWING:

Card No.	*Change No.	Card No.	*Change No.	Card No.	*Change No.
<u>Registration Mark: N8172V SN AA001</u>					
Title .....	0	2-004 .....	0	3-008 .....	0
T-2 Blank .....	0	2-005 .....	0	4-001 .....	0
A - B .....	0	2-006 .....	0	4-002 .....	0
i .....	0	2-007 .....	0	4-003 .....	0
ii .....	0	2-008 .....	0	4-004 .....	0
iii .....	0	3-001 .....	0	4-005 .....	0
iv .....	0	3-002 .....	0	4-006 .....	0
v .....	0	3-003 .....	0	4-007 .....	0
vi .....	0	3-004 .....	0	4-008 .....	0
2-001 .....	0	3-005 .....	0	5-001 .....	0
2-002 .....	0	3-006 .....	0	5-002 .....	0
2-003 .....	0	3-007 .....	0	5-003 .....	0

\*Zero in this column indicates original card

A

EXAMINED AND ACCEPTED JUN 29 2007  
SIGNED Cathy Shull m78006p01



# **PROGRAM LETTER**

For

General Atomics Aeronautical Systems, Inc. (GA-ASI)

## **Altair Special Airworthiness Certificate (Experimental)**

Date: 14 August 2007

REPORT NUMBER:	<u>DP07-200-001</u>
TITLE:	<u>Program Letter for Altair Special Airworthiness Certificate</u>
PROGRAM:	<u>Altair Experimental Recertification</u>



REPORT NUMBER: DP07-200-001TITLE: Program Letter for Altair Special Airworthiness CertificatePROGRAM: Altair Experimental Recertification

Prepared by:

  
 Michael R. Cooper  
 Program Manager

Date

8/14/07  
 14 August 2007

Approved by:

  
 Samuel Richardson  
 Program Manager

14 Aug 07  
 14 August 2007

## REVISION LOG

Rev Letter	Date	Revised by	Approved By	Pages Affected	Removed	Added	Remarks
NC	05/11/05	-	-	-	-	-	Initial Release
A	08/09/05	R. Blair	R. S. Dann	All	-	-	Incorporated FAA comments
B	08/18/05	R. Blair	R. S. Dann	3			Reference to Altair Maintenance and Inspection Program
C	08/23/05	S. Dann	R.S. Dann	All			Incorporated Final FAA Comments
D	06/05/06	M. Cooper	R.S. Dann	All			Incorporated FAA Operating Limitations
E	06/05/07	M. Cooper	R.S. Dann	All			Updated
F	08/13/07	M. Cooper	R.S. Dann	Pg.3, 3.3 Pg. 5, 5.2c	Night ops request	Distance around the op area	Incorporated Changes



## PROGRAM LETTER SPECIAL AIRWORTHINESS CERTIFICATE

## 1. Registered Owner

NAME

General Atomics Aeronautical Systems, Inc.

ADDRESS

16761 Via Del Campo Court  
San Diego, CA 92127-1713  
(Attn: Samuel Richardson)2. Aircraft Description **Altair** - remotely piloted aircraft.

## a. Registration Mark:

N8172V

## b. Aircraft Builder:

General Atomics -  
Aeronautical Systems, Inc.

## c. Yr. Mfg.

2003

## d. Aircraft Serial Number

AA001

## e. Aircraft Model Designation

Altair - UPB 97010-1

## 3. Program Purpose for which the aircraft is to be used (FAR 21.193(d) (1).

GA-ASI requests an Experimental Certificate Recertification to conduct flight operations of our Altair UAS at our Gray Butte and El Mirage Flight Operation Facilities location.

We request a renewal of our experimental certificate for operating the Altair at our Flight Operations Facilities for the following multiple purposes:

## 1.) Company research and development flights

Continue to conduct R&D flights for the improvement of various Altair aircraft sub-systems and integration of different types of payloads and sensors.

## 2.) Marketing and customer demonstrations

We would like to continue conducting flight demonstrations for various governmental agencies that demonstrate the performance characteristics of the aircraft, sensors or payloads.

## 3.) Crew training

We would like to continue to employ the Altair for crew training of company personnel.

## 4. List estimated flight hours for program.

Estimated number of flights for program:

Estimated duration for program:

Hrs: approx. 300

No. Flts: approx. 40

Duration: 1 yr





5. Describe the areas over which the flights are to be conducted, and address of base operation (FAR 21.193(d) (3)).

5.1 Address of Base of Operation

Operations will be conducted from the GA-ASI flight operations facilities located at Gray Butte and El Mirage, CA.

Gray Butte  
25500 East Avenue R-8  
Palmdale, CA 93550  
(661) 233-6000

El Mirage  
73 El Mirage Airport Road – Suite B  
Adelanto, CA 922301  
(760) 388-8100

5.2 Flight Area

- a. All flight operations will be conducted under Visual flight Rules (VFR). The flight operations area is depicted graphically below. This area shall be referred to as the "Primary Containment Area". It should be recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should Altair venture beyond the boundaries of the SUA (e.g. spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the Primary Containment Area. In these circumstances, General Atomics will notify the FAA of the breach of any operations.
- b. Flight operations in the Primary Containment Area will be conducted at or below 13,000 feet MSL within the boundaries defined below. Flight operations will not be conducted within the Victorville (KVCV) Class D airspace. When operating in a terminal environment, Altair will have line of sight communications.
- c. Beginning at:
  - lat. 34°29'47"N, long. 117°45'23"W, to
  - lat. 34°37'41"N, long. 117°45'23"W, (7.89 nm) to
  - lat. 34°46'21"N, long. 117°42'00"W, (9.10nm) to
  - lat. 34°46'30"N, long. 117°35'03"W, (5.71 nm) to
  - lat. 34°49'30"N, long. 117°26'03"W, (13.47 nm) to
  - lat. 34°51'17"N, long. 117°26'03"W, (1.78 nm) to
  - lat. 34°54'50"N, long. 117°03'30"W, (18.84 nm) to
  - lat. 34°35'22"N, long. 117°01'38"W, (19.53 nm) to
  - lat. 34°29'50"N, long. 117°29'25"W, (32.85 nm) thence to the point of beginning (13.13 nm).



- d. The PIC will ensure that all UA flight operations remain within the lateral and vertical boundaries of the Primary Containment Area or any SUA approved by the using agency. Furthermore, the PIC will take into account all factors that may affect the capability of remaining within the containment areas. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.
- e. Any flight operation that transgresses the lateral or vertical boundaries of the Primary Containment Area or any SUA shall be immediately terminated, and Air Traffic Control immediately notified of the flight status.
- g. All Altair operations will be performed under the established General Atomics inspection and maintenance procedures delineated in ASI-00991 and ASI-00992.
- h. Pilot qualification and flight review will be conducted IAW company procedure ASI-00009.

6. Describe Aircraft Configuration (3 View Drawing Attached.)

a.) Altair Aircraft

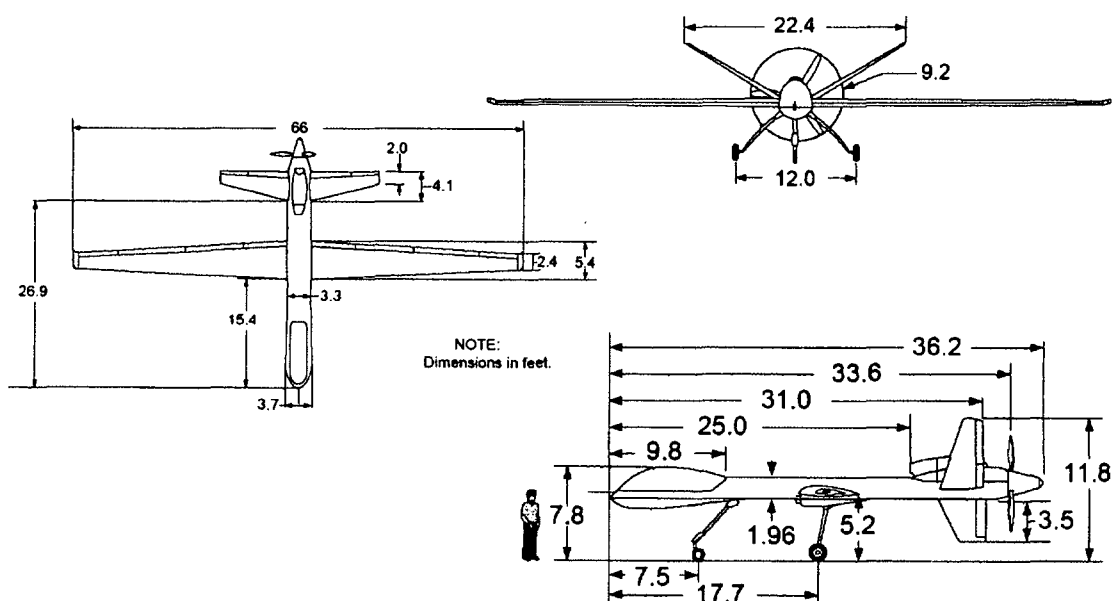
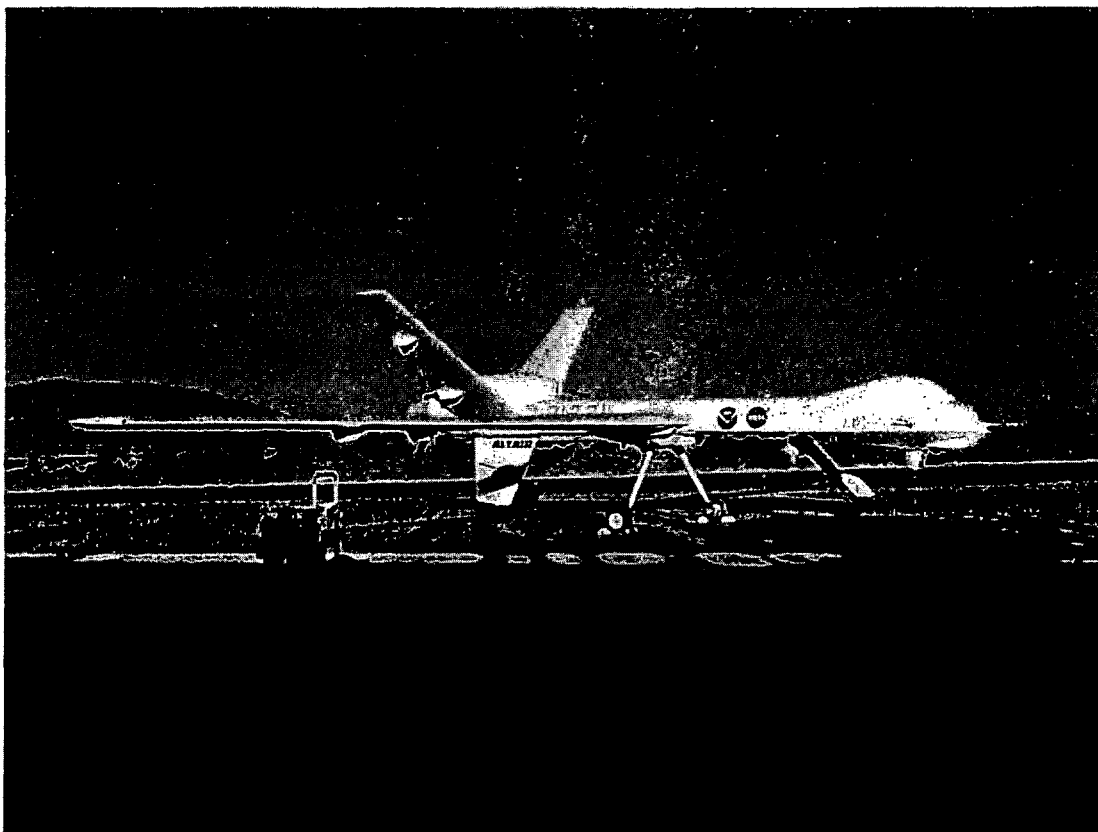
The Altair is a remotely piloted turboprop aircraft. The aircraft is a 7,500 lb GTOW mid-wing monoplane with high-aspect-ratio wing, v-tails, and conventional landing gear. The Altair is constructed of graphite composites and incorporates a 750 SHp Honeywell TPE-331-10Y-511GA turbo-prop engine and a 9.2' McCauley 3-bladed propeller in a pusher configuration. The aircraft is designed to +3.8/-1.5 g limit load and +5.7/-2.3g ultimate load. The aircraft provides substantial reliability and safety features which allow the aircraft to survive any foreseeable single avionics failure and is equipped with (triple) redundant avionics and flight control system, Mode S Transponder, ice detection, standard aviation lighting, and redundant forward looking video. The aircraft holds 3,030 lbs of fuel (Jet A+, Jet A-1, JP-8) in seven fuel tanks incorporated in the fuselage and wings and has a max endurance of 34 hours. Max Altitude is 54,000 ft. Vc at 12Kft is 151 KTAS. Max range round trip is 3,400 nm. See ASI-00920 for further description.

b.) Ground Control Station

The aircraft is flown by a pilot from a Ground Control Station (GCS) that can be located in a building or in a portable shelter. The GCS incorporates pilot workstations that allow the pilots to control the aircraft, navigate, and monitor aircraft systems. The GCS has independent-redundant pilot control stations and data-links. The aircraft is capable of being operated continually by the pilot (pilot-in-the-loop) and is also capable of fully autonomous flight. The aircraft can be flown line-of-sight out to approximately 130nm of the GCS utilizing the C-Band data link or beyond line-of-sight with the Ku-Satcom data link. The pilot maintains contact with ATC via two ARC-210 radios.



These radios operate at all times whether the aircraft is flown line-of-sight or over-the-horizon. See ASI-00920 for further description.



Altair 3-View Drawing



Report: DP07-200-001

Title: Program Letter for Altair Special Airworthiness Recertification

Rev F

Date: 14 Aug 2007

Please direct all correspondence to:

Samuel Richardson  
General Atomics Aeronautical Systems, Inc.  
16761 Via Del Campo Court  
San Diego, CA 92127-1713  
(858) 312-3319







**EXPERIMENTAL - OPERATING LIMITATIONS**  
**RESEARCH AND DEVELOPMENT, CREW TRAINING, or MARKET SURVEY**

<b>REGISTERED OWNER NAME:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC. (GA-ASI)	<b>AIRCRAFT BUILDER:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS
<b>REGISTERED OWNER ADDRESS:</b>  16761 VIA DEL CAMPO CT SAN DIEGO, CA 92127	<b>YEAR MANUFACTURED:</b>  2003
<b>AIRCRAFT DESCRIPTION:</b>  FIXED WING, TURBO PROP	<b>AIRCRAFT SERIAL NUMBER:</b>  AA001
<b>AIRCRAFT REGISTRATION:</b>  N8172V	<b>AIRCRAFT MODEL DESIGNATION:</b>  ALTAIR UPB97010-1
	<b>ENGINE MODEL:</b> Honeywell TPE-331T
	<b>PROPELLER MODEL:</b> McCauley 3-Bladed

**The following conditions and limitations apply to all General Atomics Aeronautical Systems Inc (GA-ASI) Altair flight operations while operating in the National Airspace System (NAS):**

**1. GENERAL**

a. For the purposes of this **Special Airworthiness Certificate and limitations**, the Altair Unmanned Aircraft System (UAS), owned and operated by GA-ASI, is considered to be an integrated system. The integrated system is composed of the Altair aircraft, S/N: AA001, unmanned aircraft (UA) pilot, UA control station(s) (fixed or mobile), telemetry, navigation and communications equipment to include ground, air, and space based equipment that is used for control of the Altair UA. The UAS also includes equipment on the ground and in the air that is used for communication with the chase aircraft and FAA Air Traffic Control.

b. Unless otherwise specified in this document, the Pilot-in-Command (PIC) and GA-ASI shall comply with all applicable sections and parts of 14 CFR including, but not limited to, parts



61 and 91. Alternative methods of compliance with specific regulations shall be annotated in this document as required.

c. No person may operate this UAS for other than the purpose of R&D, crew training, or market surveys, to accomplish the flight operation outlined in GA-ASI Program Letter dated August 14, 2007, which describes compliance with §21.193(d), and has been made available to the pilot in command of the UAS. In addition, this UAS must be operated in accordance with applicable air traffic and general operating rules of part 91, and all additional limitations herein prescribed under the provisions of §91.319(e).

d. The PIC must determine that the UAS is in a condition for safe operation, and in a configuration appropriate for the intended purpose of the flight.

e. No person may operate this UA to carry property for compensation or hire.

f. This UA must be marked with its U.S. Registration number in accordance with 14 CFR part 45.

g. This UA must display the word "EXPERIMENTAL" in accordance with §45.23(b).

h. Prior to conducting the initial Altair flight operations, General Atomics Aeronautical Systems, Inc. must forward a copy of the Altair's Program Letter, Special Airworthiness Certificate, and Operating Limitations to the FAA Western Terminal Service Area, Debra Trindle, Air Traffic Representative, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov) or via fax at 623-856-8339 (cover sheet req'd), Airspace Branch, AWP-520.

i. Section 47.45 requires that the FAA Aircraft Registry must be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by submitting Form 8050-1 to AFS-750 in Oklahoma City, Oklahoma.

## **2. PROGRAM LETTER**

The GA-ASI's Altair research and development Program Letter, dated August 14, 2007, shall be used as a basis for the determination of the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

## **3. AUTHORIZED FLIGHT OPERATIONS AREA**

a. The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

b. All flight operations shall be conducted under Day Visual Flight Rules (VFR) only. The flight operations area authorized for the UA is depicted graphically below. This area shall be referred to as the "Primary Containment Area". It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g.



#### **4. UA PILOT AND OBSERVER**

a. All flight operations conducted in the Primary Containment Area shall have an observer to perform traffic avoidance and visual observation to fulfill the "see and avoid" requirement of §91.113.

b. UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

c. All observers shall:

- 1) Hold at a minimum, an FAA Private Pilot certificate, or
- 2) Successfully completed specific observer training acceptable to the FAA.

d. UA pilots shall maintain currency in manned airplanes per §61.57.

e. UA pilots shall maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

f. UA pilots shall have a Flight Review in manned aircraft every 24 calendar months per §61.56.

g. UA pilots shall have a Flight Review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

h. Pilots and Observers shall have successfully completed applicable manufacturer training for high level systems and operational understanding of the UAS.

i. Pilots and observers must have in their possession a valid third class (or higher) airman medical certificate that has been issued under 14 CFR part 67.

j. A PIC must be designated at all times and responsible for the safety of the UAS and persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground. The PIC shall avoid densely populated areas (14 CFR § 91.319) and exercise increased vigilance when operating within published airway boundaries.

k. UAS pilots and observers shall perform crew duties for only one UA at a time. When the observer is located in a chase aircraft, the observer's duties shall be dedicated to the task of observation only, concurrent duty as pilot is not authorized.

l. All observers must be thoroughly trained, familiar with, and possess, operational experience with the equipment being utilized for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.

m. Visual Observer Responsibilities: The task of the observer is to provide the pilot of the UA with instructions to maneuver the UA clear of any potential collision with other traffic.



Visual observer duties require continuous visual contact with the UA at all times in such a manner as to be able to discern UA attitude and trajectory. At no time shall the visual observer permit the UA to operate beyond line-of-sight necessary to ensure that maneuvering information can be reliably determined. At no time shall visual observers conduct their duties more than three statute miles laterally or 3000 feet vertically from the UA. Observers must maintain continuous visual contact with the UA. When a chase aircraft is utilized, it must maintain a reasonable proximity, and shall position itself relative to the UA in such a manner to reduce the hazard of collision per §91.111.

## **5. COMMUNICATIONS**

- a. Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation
- b. Upon initial contact with ATC, the PIC must indicate the experimental nature in accordance with 14 CFR § 91.319.
- c. The PIC must maintain two-way communication with ATC. If a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way communications with ATC and with the PIC.
- d. The PIC and observer(s) must maintain two-way communications with each other during all operations.
- e. If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.
- f. Spectrum used for operation and control of the UAS must be approved by the FCC, or other appropriate government oversight agency prior to operations being conducted.

## **6. FLIGHT CONDITIONS**

- a. All flight operations must be conducted in visual meteorological conditions (VMC), including cloud clearance minimums as specified in 14 CFR § 91.155. Flight operation in instrument meteorological conditions (IMC) is not permitted.
- b. All flight operations within the Primary Containment Area as specified in Section 3d shall be conducted during daylight hours only.
- b. The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA's attitude, an abnormal acceleration, or other flight action not necessary for normal flight (§91.303).
- c. Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.





- d. The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights. Strobe/anti-collision lights shall be illuminated at all times.
- e. The UA must operate an altitude encoding transponder (Mode S) in accordance with applicable guidelines and procedures.
- f. The chase aircraft transponder must be on standby while performing chase operation flight with the UA. In the event of UA transponder failure, the chase aircraft will contact ATC and assume transponder operations.
- g. In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.
- h. GA-ASI must request Notice to Airman (NOTAM) issuance through the appropriate Automated Flight Service twenty-four (24) hours prior to plan operation.

## **7. FLIGHT TERMINATION & LOST LINK PROCEDURES**

- a. In accordance with GA-ASI Program Letter, dated August 14, 2007, flight operations must be discontinued at any point that operation within the approved flight area(s) is breached and the control of the UA is questionable. If it is determined that the UA is still under control of the PIC, the UA shall return to base (RTB).
- b. In the event of lost link, the UAS must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the primary containment area. The UAS PIC will immediately notify ATC, chase aircraft/observer of the loss of link condition and what the expected UA response will be.

## **8. MAINTENANCE**

- a. This UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992. Each inspection must be recorded in the UAS maintenance records.
- b. No person must operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with, FAA-approved, General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992, and was found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records.
- c. Only those individuals authorized by General Atomics, and acceptable to the FAA, may perform inspections required by these operating limitations.
- d. Inspections of the UAS must be recorded in the UAS maintenance records showing the following, or a similarly worded, statement: "I certify that this UAS has been inspected on



[insert date] in accordance with the scope and detail of the General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992, and was found to be in a condition for safe operation." The entry will include the UAS's total time-in-service, and the name and signature of the person performing the inspection.

e. UAS instruments and equipment installed must be inspected and maintained in accordance with the requirements of the General Atomics Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

f. No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with 14 CFR §91.411 and §91.413 respectively. These inspections will be recorded in the UA maintenance records.

## **9. EQUIPAGE**

The UA shall be equipped with two-way communications equipment allowing communications between the UAS pilot, chase aircraft, and ATC facilities.

## **10. INFORMATION REPORTING**

a. General Atomics shall provide the following information to Kenneth.d.Davis@faa.gov on a monthly basis. A copy of this report shall be provided to AIR-200.

- 1) Number of flights conducted under this certificate.
- 2) Pilot duty time per flight.
- 3) Unusual equipment malfunctions (hardware or software), if any.
- 4) Deviations from ATC instructions.
- 5) Unintended entry into lost link flight mode that results in a course change.

b. A copy of this report shall be provided to AIR-200.

## **11. REVISIONS**

a. The experimental certificate, General Atomics FAA-accepted program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles MIDO, and coordinated with the Production and Airworthiness Division, AIR-200. AIR-200 will be responsible for headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic, Office of Chief Council, and Office of Rulemaking.

b. No Certificate of Authorization or Waiver may be issued in association with this Experimental Certificate unless coordinated with the Los Angeles MIDO and the Production and Airworthiness Division, AIR-200.

c. The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.



d. All revisions to GA-ASI FAA-approved Inspection and Maintenance Program ASI-01909-WC2 and ASI-00992 must be reviewed and approved by the Van Nuys Flight Standards District Office.

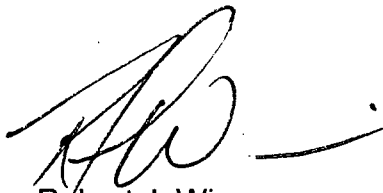
## **12. UA MODIFICATIONS**

a. All software and system changes will be documented as part of the normal maintenance procedures and be available for inspection. All software and system changes shall be inspected and approved per GA's maintenance procedures. All software changes to the aircraft and GCS are categorized as major changes, and shall be provided in summary form at the time they are incorporated.

b. All major modifications, whether performed under the experimental certificate or COA, that could potentially effect the safe operation of the system, shall be documented and shall be provided to the FAA prior to operating the aircraft under this certificate. Major modifications incorporated under COA need only be provided if the aircraft is flown under COA during the effective period of the experimental certificate.

c. All information requested shall be provided to AIR-200.

End of limitations.



Robert J. Winn  
Los Angeles Manufacturing Inspection District Office  
3690 Paramount Blvd.  
Lakewood, CA 90712

Date: August 15, 2007



I certify that I have read and understand the operating limitations, and conditions, that are a part of the Special Airworthiness Certificate, FAA Form 8130-7 issued August 15, 2007, for the purpose of Research and Development, Crew Training, or Market Survey.

This Airworthiness Certificate is issued for General Atomics UA model "ALTAIR UPB97010-1", serial number AA001, registration number N8172V.

Note: If the so stated limitations or conditions cannot be complied with, Altair flight operations shall be terminated.

  
\_\_\_\_\_  
Applicant (signature)

Date: August 15, 2007

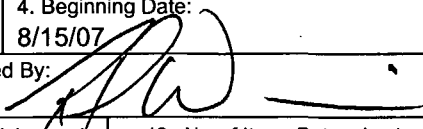
Name: Gary Bender

Title: Director Flight Operations

Company: General Atomics ASI





Conformity Inspection Record			1. Project Number, TIA/Request Date:		2. SHEET of Sheets 1 of 1	
3. Applicant/Manufacturer: General Atomics Aeronautical Systems, Inc., Gray Butte, CA				4. Beginning Date: 8/15/07		5. Ending Date: 8/15/07
6. Model: Altair: S/N AA001			7. Inspected By: R Winn 			
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Determined		13. Comments
				SAT.	UNSAT.	
1	Application for Airworthiness	FAA Form 8130-6	10-04	1		verified properly formatted document and signature from Gary Bender Director of Flt Ops. Dtd: 8/14/07
2	Altair Maint. & Insp. Program	ASI-00991/ASI-00992	8/05/05	1		Verified acceptance by Van Nuys FSDO Dtd: 8/24/05 Signed by: Cotry Shearrill Van Nuys FSDO Inspector
3	Altair Inspection Work Cards	ASI-01909-WC2	6/25/07	1		Verified Acceptance by Van Nuys FSDO Dtd: 6/29/07 Signed by: Cotry Shearrill Van Nuys FSDO Inspector
4	Program Letter for GA-ASI Altair Special Airworthiness Certificate	DP07-200-001	8/14/07 Rev: F	1		verified contents of program letter meet the application requirements as determined by an FAA Team consisting of representatives from AIR-160, AIR-200, AFS-300, AFS-430, local MIDO, FSDO and Air Traffic Personnel
5	Unmanned Aircraft Systems	Altair UAV (s/n: AA001) and Ground Control Station (GCS)	n/a	1		Inspected primary UAV and GCS for airworthiness, latest inspections, and operability. Acft. registration marking: N8172V IAW 14 CFR 45 S/N: AA001
6	Operating Limitations/Experimental	R&D/Crew Training/Market Survey	Dtd: 8/15/07	1		Issued by the Los Angeles-Manufacturing Inspection District Office and signed by Aviation Safety Inspector: Robert Winn counter signed by GA-ASI Flt. Operations Dir.: Gary Bender
7	Aircraft logbook entry	per Order 8130.UAS	8/15/07	1		Entry made in UAV logbook after airworthiness inspection of UAS The next condition inspection is due on or before 8/15/2008
8	Special Airworthiness Certificate	FAA Form 8130-7	(10/82)	1		issued: 8/15/07 Expires: 8/14/08 Signed: Robert J. Winn (ASI-Mfg)



# FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018  
09/30/2007

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.					
		1. REGISTRATION MARK		2. AIRCRAFT BUILDER'S NAME (Make)		3. AIRCRAFT MODEL DESIGNATION		4. YR. MFR.	FAA CODING
		N8172V		General Atomics		Altair-UPB97010-1		2003	0610002
		5. AIRCRAFT SERIAL NO.		6. ENGINE BUILDER'S NAME (Make)		7. ENGINE MODEL DESIGNATION		11. AIRCRAFT IS (Check if applicable)	
AA001		Honeywell		TPE 331-10T		33989			
8. NUMBER OF ENGINES		9. PROPELLER BUILDER'S NAME (Make)		10. PROPELLER MODEL DESIGNATION					
1		McCauley		X3GFR36C606					
APPLICATION IS HEREBY MADE FOR: (Check applicable items)									
A 1 STANDARD AIRWORTHINESS CERTIFICATE (Indicate Category) <input type="checkbox"/> NORMAL <input type="checkbox"/> UTILITY <input type="checkbox"/> ACROBATIC <input type="checkbox"/> TRANSPORT <input type="checkbox"/> COMMUTER <input type="checkbox"/> BALLOON <input type="checkbox"/> OTHER									
B <input checked="" type="checkbox"/> SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)									
7 PRIMARY									
9 LIGHT-SPORT (Indicate Class) <input type="checkbox"/> AIRPLANE <input type="checkbox"/> POWER-PARACHUTE <input type="checkbox"/> WEIGHT-SHIFT-CONTROL <input type="checkbox"/> GLIDER <input type="checkbox"/> LIGHTER THAN AIR									
2 LIMITED									
5 PROVISIONAL (Indicate Class) <input type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II									
3 RESTRICTED (Indicate operation(s) to be conducted) <input type="checkbox"/> 1 AGRICULTURE AND PEST CONTROL <input type="checkbox"/> 2 AERIAL SURVEY <input type="checkbox"/> 3 AERIAL ADVERTISING									
<input type="checkbox"/> 4 FOREST (Wildlife Conservation) <input type="checkbox"/> 5 PATROLLING <input type="checkbox"/> 6 WEATHER CONTROL									
<input type="checkbox"/> 0 OTHER (Specify)									
4 <input checked="" type="checkbox"/> EXPERIMENTAL (Indicate operation(s) to be conducted) <input type="checkbox"/> 1 RESEARCH AND DEVELOPMENT <input type="checkbox"/> 2 AMATEUR BUILT <input type="checkbox"/> 3 EXHIBITION									
<input type="checkbox"/> 4 AIR RACING <input type="checkbox"/> 5 CREW TRAINING <input checked="" type="checkbox"/> 6 MARKET SURVEY									
<input type="checkbox"/> 0 TO SHOW COMPLIANCE WITH THE CFR <input type="checkbox"/> 7 OPERATING (Primary Category) KIT BUILT AIRCRAFT									
8 <input type="checkbox"/> OPERATING LIGHT-SPORT <input type="checkbox"/> 8A Existing Aircraft without an airworthiness certificate & do not meet § 103.1									
<input type="checkbox"/> 8B Operating Light-Sport Kit-Built									
<input type="checkbox"/> 8C Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190									
8 SPECIAL FLIGHT PERMIT (Indicate operation(s) to be conducted, then complete Section VI or VII as applicable on reverse side) <input type="checkbox"/> 1 FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE									
<input type="checkbox"/> 2 EVACUATION FROM AREA OF IMPENDING DANGER									
<input type="checkbox"/> 3 OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT									
<input type="checkbox"/> 4 DELIVERING OR EXPORTING <input type="checkbox"/> 5 PRODUCTION FLIGHT TESTING									
<input type="checkbox"/> 6 CUSTOMER DEMONSTRATION FLIGHTS									
C 6 MULTIPLE AIRWORTHINESS CERTIFICATE (check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)									
III. OWNER'S CERTIFICATION									
A. REGISTERED OWNER (As shown on certificate of aircraft registration) <div style="display: flex; justify-content: space-between;"> <div>NAME General Atomics Aeronautical Systems, Inc. (Attn: Scott Dann)</div> <div>IF DEALER, CHECK HERE <input type="checkbox"/></div> </div>									
ADDRESS 16761 Via del Campo Court San Diego, CA 92127-1713									
B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)									
<input checked="" type="checkbox"/> AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.) Experimental									
AIRCRAFT LISTING (Give page number(s))									
SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated)									
C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS									
CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417									
TOTAL AIRFRAME HOURS 391.1									
3 EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) 90.5									
D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.									
DATE OF APPLICATION August 18, 2006									
NAME AND TITLE (Print or type) R. Scott Dann, Domestic Programs Manager									
SIGNATURE									
IV. INSPECTION AGENCY VERIFICATION									
A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies.									
2 14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)									
3 CERTIFICATED MECHANIC (Give Certificate No.)									
6 CERTIFICATED REPAIR STATION (Give Certificate No.)									
5 <input checked="" type="checkbox"/> AIRCRAFT MANUFACTURER (Give name or firm) General Atomics Aeronautical Systems, Inc.									
DATE August 18, 2006									
TITLE R. Scott Dann, Domestic Programs Manager									
SIGNATURE									
V. FAA REPRESENTATIVE CERTIFICATION									
(Check ALL applicable block items A and B)									
A. I find that the aircraft described in Section I or VII meets requirements for									
4 THE CERTIFICATE REQUESTED AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE									
B. Inspection for a special permit under Section VII was conducted by:									
FAA INSPECTOR									
FAA DESIGNEE									
CERTIFICATE HOLDER UNDER									
14 CFR part 65									
14 CFR part 121 OR 135									
14 CFR part 145									
DATE 8/22/06									
DISTRICT OFFICE NM-46									
DESIGNEE'S SIGNATURE AND NO.									
1									



<b>VI. PRODUCTION FLIGHT TESTING</b>	A. MANUFACTURER				
	NAME		ADDRESS		
	B. PRODUCTION BASIS (Check applicable item)				
		PRODUCTION CERTIFICATE (Give production certificate number) _____			
		TYPE CERTIFICATE ONLY			
		APPROVED PRODUCTION INSPECTION SYSTEM			
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS				
	DATE OF APPLICATION		NAME AND TITLE (Print or Type)		
			SIGNATURE		
	A. DESCRIPTION OF AIRCRAFT				
	REGISTERED OWNER		ADDRESS		
	BUILDER (Make)		MODEL		
	SERIAL NUMBER		REGISTRATION MARK		
	B. DESCRIPTION OF FLIGHT				
	FROM		TO		
	VIA		DEPARTURE DATE		
			DURATION		
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT				
	PILOT	CO-PILOT	FLIGHT ENGINEER	OTHER (Specify)	
D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:					
E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: (Use attachment if necessary)					
F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.					
DATE		NAME AND TITLE (Print or Type)		SIGNATURE	
<b>VIII. AIRWORTHINESS DOCUMENTATION (FAA Designee use only)</b>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.		G. Statement of Conformity, FAA Form 8130-9 (Attach when required)	
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft (Attach when required)	
	<input type="checkbox"/>	C. Data, Drawings, Photographs, etc. (Attach when required)		I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section _____ CAR _____ (Original Attached)	
	<input checked="" type="checkbox"/>	D. Current Weight and Balance information Available in Aircraft <u>IN GCS</u>		J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section <u>21.191 a, c, f</u> (Copy Attached)	
	<input type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 (Attach when required)		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 (Attach when required)	
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records			



UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION  
**SPECIAL AIRWORTHINESS CERTIFICATE**

<b>A</b>	CATEGORY/DESIGNATION		<b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>		
	PURPOSE		<b>Research &amp; Development, Crew Training or Market Survey</b>		
<b>B</b>	MANUFACTURER	NAME		N/A	
		ADDRESS		N/A	
<b>C</b>	FLIGHT	FROM		N/A	
		TO		N/A	
<b>D</b>	N- 8172V		SERIAL NO. AA001		
	BUILDER General Atomics ASI		MODEL ALT AIR UPB97010-1		
<b>E</b>	DATE OF ISSUANCE 08-25-05		EXPIRY 08-25-06		
	OPERATING LIMITATIONS DATED 08-25-05		ARE A PART OF THIS CERTIFICATE		
	SIGNATURE OF FAA REPRESENTATIVE <i>Alfonso D. Ontiveros</i> <b>Alfonso D. Ontiveros</b>		DESIGNATION OR OFFICE NO. <b>ANM-108L</b>		

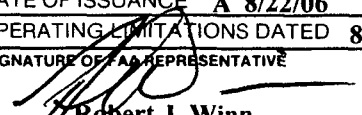
Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

A	This airworthiness certificate is issued under the authority of the Federal Aviation Act of 1958 and the Federal Aviation Regulations (FAR).
B	This airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable FAR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable FAR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in FAR Part 21, Section 21.181 or 21.217.



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A	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research and Development, Crew Training or Market Survey</b>	
B	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
C	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
D	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>ALTAIR UPB97010-1</b>
E	DATE OF ISSUANCE <b>A 8/22/06</b>	EXPIRY <b>8/22/07</b>
	OPERATING LIMITATIONS DATED <b>8/22/06</b> ARE A PART OF THIS CERTIFICATE	
E	SIGNATURE OF FAA REPRESENTATIVE  <b>Robert J. Winn</b>	DESIGNATION OR OFFICE NO. <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.





U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

800 Independence Ave, S.W.  
Washington, D.C. 20591

**EXPERIMENTAL - OPERATING LIMITATIONS**  
**RESEARCH AND DEVELOPMENT, CREW TRAINING, or MARKET SURVEY**

<b>REGISTERED OWNER NAME:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC. (GA-ASI)	<b>AIRCRAFT BUILDER:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS
<b>REGISTERED OWNER ADDRESS:</b>  16761 VIA DEL CAMPO CT SAN DIEGO, CA 92127	<b>YEAR MANUFACTURED:</b>  2003
<b>AIRCRAFT DESCRIPTION:</b>  FIXED WING, TURBO PROP	<b>AIRCRAFT SERIAL NUMBER:</b>  AA001
<b>AIRCRAFT REGISTRATION:</b>  N8172V	<b>AIRCRAFT MODEL DESIGNATION:</b>  ALTAIR UPB97010-1
	<b>ENGINE MODEL:</b> Honeywell TPE-331T
	<b>PROPELLER MODEL:</b> McCauley 3-Bladed

The following conditions and limitations apply to all General Atomics Aeronautical Systems Inc (GA-ASI) Altair flight operations while operating in the National Airspace System (NAS):

**1. GENERAL**

a. For the purposes of this **Special Airworthiness Certificate and limitations**, the Altair Unmanned Aircraft System (UAS), owned and operated by GA-ASI, is considered to be an integrated system that is composed of the Altair aircraft, S/N: AA001, unmanned aircraft (UA) pilot, UA control station(s) (fixed or mobile), telemetry, navigation and communications equipment to include ground, air, and space based equipment that is used for control of the Altair UA. The UAS also includes equipment on the ground and in the air that is used for communication with the chase aircraft and FAA Air Traffic Control.

b. Unless otherwise specified in this document, the Pilot-in-Command (PIC) and GA-ASI shall comply with all applicable sections and parts of 14 CFR including, but not limited to, parts



61 and 91. Alternative methods of compliance with specific regulations shall be annotated in this document as required.

c. No person may operate this UAS for other than the purpose of Research and Development (R&D), crew training, or market surveys, to accomplish the flight operation outlined in GA-ASI Program Letter dated June 30, 2006, which describes compliance with §21.193(d), and has been made available to the pilot in command of the UAS. In addition, this UAS must be operated in accordance with applicable air traffic and general operating rules of part 91, and all additional limitations herein prescribed under the provisions of §91.319(e).

d. The PIC must determine that the UAS is in a condition for safe operation, and in a configuration appropriate for the intended purpose of the flight.

e. No person may operate this UA to carry property for compensation or hire.

f. This UA must be marked with its U.S. Registration number in accordance with 14 CFR part 45.

g. This UA must display the word "EXPERIMENTAL" in accordance with §45.23(b).

h. Prior to conducting the initial Altair flight operations, General Atomics Aeronautical Systems, Inc. must forward a copy of the Altair's Program Letter, Special Airworthiness Certificate, and Operating Limitations to the FAA Western Terminal Service Area, Debra Trindle, Airspace Specialist, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov) or via fax at 623-856-8339 (cover sheet req'd), Airspace Branch, AWP-520.

i. Section 47.45 requires that the FAA Aircraft Registry must be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by submitting Form 8050-1 to AFS-750 in Oklahoma City, Oklahoma.

## **2. PROGRAM LETTER**

The GA-ASI's Altair research and development Program Letter, dated June 30, 2006, shall be used as a basis for the determination of the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

## **3. AUTHORIZED FLIGHT OPERATIONS AREA**

a. The base of operations for the UAS shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.

b. The flight operations area authorized for the UA is depicted graphically below. This area shall be referred to as the "Primary Containment Area." It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA



(e.g., spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the Primary Containment Area. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.

c. Flight operations in the Primary Containment Area shall be conducted at or below 13,000 feet MSL within the boundaries defined below. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. When operating in a terminal environment, the UA must have line of sight communications.

d. Beginning at:

lat. 34°29'47"N, long. 117°45'23"W, to  
lat. 34°37'41"N, long. 117°45'23"W, to  
lat. 34°46'21"N, long. 117°42'00"W, to  
lat. 34°46'30"N, long. 117°35'03"W, to  
lat. 34°49'30"N, long. 117°26'03"W, to  
lat. 34°51'17"N, long. 117°26'03"W, to  
lat. 34°54'50"N, long. 117°03'30"W, to  
lat. 34°35'22"N, long. 117°01'38"W, to  
lat. 34°29'50"N, long. 117°29'25"W, thence to the point of beginning.

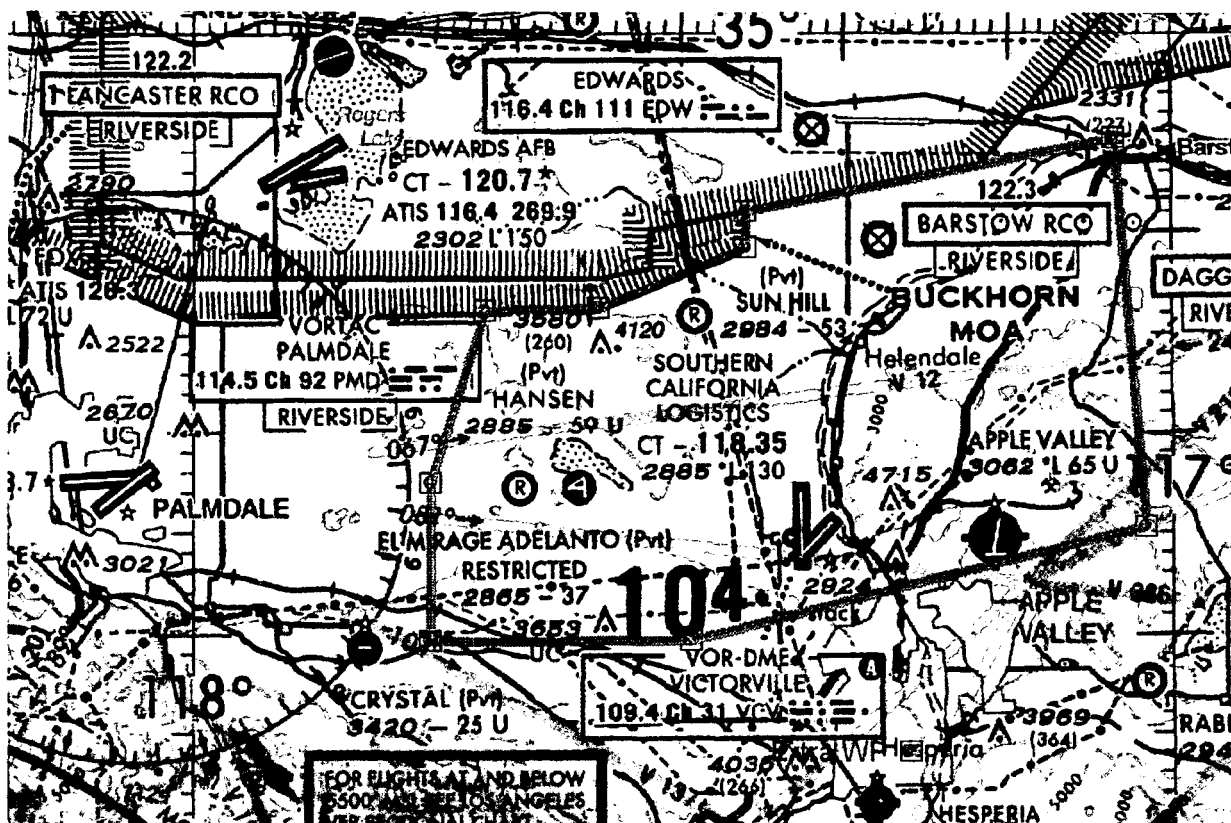


Figure 1: Primary Containment Area (WAC Depiction)





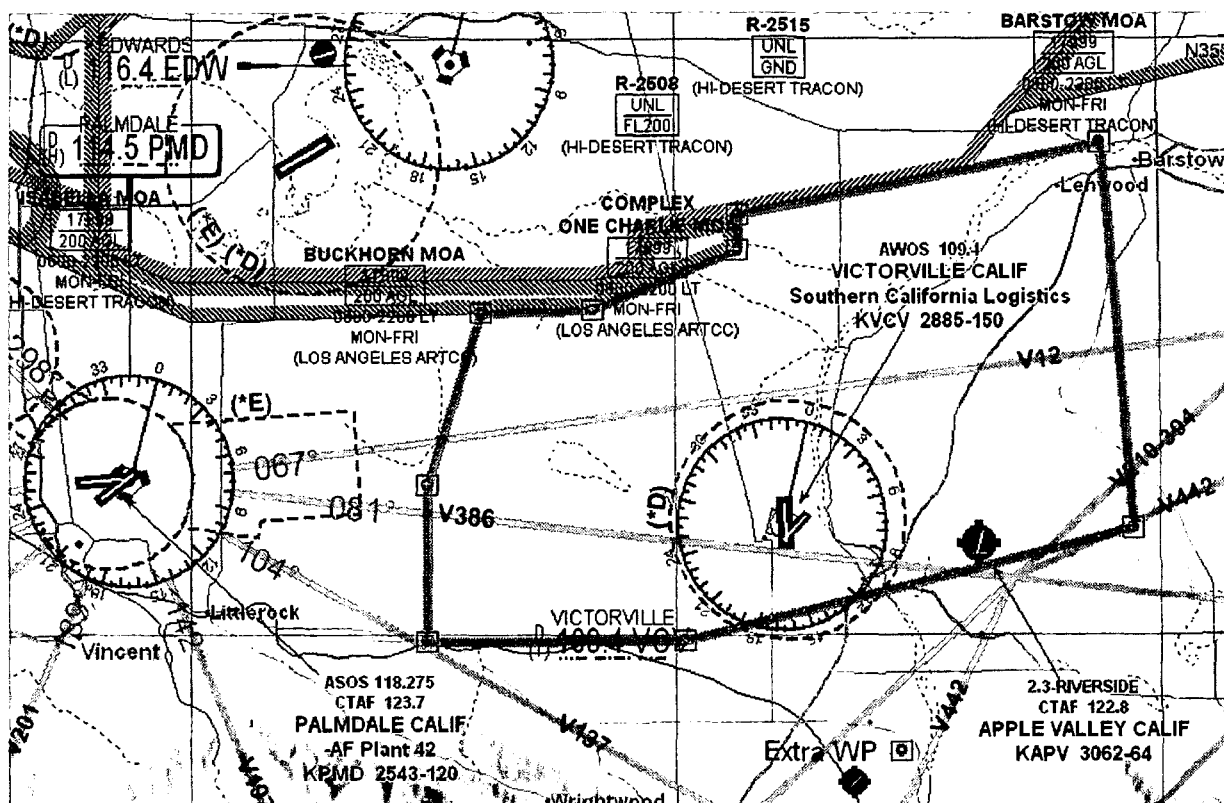


Figure 2: Primary Containment Area

e. The PIC shall ensure that all UA flight operations remain within the lateral and vertical boundaries of the Primary Containment Area or any SUA approved by the using agency. Furthermore, the PIC shall take into account all factors that may affect the capability of remaining within the containment areas. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

f. Incident / Accident Reporting. Any incident / accident and any flight operation that transgresses the lateral or vertical boundaries of the Primary Containment Areas or any SUA shall be reported to the FAA, Manager AIR-160, as soon as practicable, always within 24 hours. The AIR-160 Manager can be reached at telephone number 202-385-4636, or by fax at 202-385-4651. The point of contact is Mr. Doug Davis. The report may be provided by either phone, or e-mail to [Kenneth.d.davis@faa.gov](mailto:Kenneth.d.davis@faa.gov). Further flight operations shall not be conducted until the incident / accident is reviewed by ATO, AFS, and AIR-160, and authorization to resume operations is received.

g. If the review reveals issues with the operating limitations, the FAA may revise / amend the operating limitations as part of the authorization to resume operations.

#### 4. UA PILOT AND OBSERVER

a. All flight operations conducted in the Primary Containment Area shall have an observer to perform traffic avoidance and visual observation to fulfill the "see and avoid" requirement of §91.113.



**b.** UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, and have it in their possession.

**c.** All observers shall:

- 1) Hold at a minimum, an FAA Private Pilot certificate, or
- 2) Successfully completed specific observer training acceptable to the FAA.

**d.** UA pilots shall maintain currency in manned airplanes per §61.57.

**e.** UA pilots shall maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.

**f.** UA pilots shall have a Flight Review in manned aircraft every 24 calendar months per §61.56.

**g.** UA pilots shall have a Flight Review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.

**h.** Pilots and Observers shall have successfully completed applicable manufacturer training for all components of the UAS.

**i.** Pilots and observers must have in their possession a valid third class (or higher) airman medical certificate that has been issued under 14 CFR part 67.

**j.** A PIC must be designated at all times and be responsible for the safety of the UAS and persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground. The PIC shall avoid densely populated areas (14 CFR § 91.319) and exercise increased vigilance when operating within published airway boundaries.

**k.** UAS pilots and observers shall perform crew duties for only one UA at a time. When the observer is located in a chase aircraft, the observer's duties shall be dedicated to the task of observation only, concurrent duty as pilot is not authorized.

**l.** All observers must be thoroughly trained, familiar with, and possess, operational experience with the equipment being utilized for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.

**m.** Visual Observer Responsibilities: The task of the observer is to provide the pilot of the UA with instructions to maneuver the UA clear of any potential collision with other traffic. Visual observer duties require continuous visual contact with the UA at all times in such a manner as to be able to discern UA attitude and trajectory. At no time shall the visual observer permit the UA to operate beyond line-of-sight necessary to ensure that maneuvering information can be reliably determined. At no time shall visual observers conduct their duties more than three statute miles laterally or 3000 feet vertically from the UA. Observers must maintain continuous



visual contact with the UA. When a chase aircraft is utilized, it must maintain a reasonable proximity, and shall position itself relative to the UA in such a manner to reduce the hazard of collision per §91.111.

## **5. COMMUNICATIONS**

a. Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation.

b. Upon initial contact with ATC, the PIC must indicate the experimental nature in accordance with 14 CFR § 91.319.

c. The PIC must maintain two-way communication with ATC. If a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way communications with ATC and with the PIC.

d. The PIC and observer(s) must maintain two-way communications with each other during all operations.

e. If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.

f. Spectrum used for operation and control of the UAS must be approved by the FCC or other appropriate government oversight agency prior to operations being conducted.

## **6. FLIGHT CONDITIONS**

a. All flight operations must be conducted in visual meteorological conditions (VMC), including cloud clearance minimums as specified in 14 CFR § 91.155. Flight operation in instrument meteorological conditions (IMC) is not permitted.

b. All flight within the Primary Containment Area as specified in Section 3d shall be conducted during daylight hours only.

c. The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA's attitude, an abnormal acceleration, or other flight action not necessary for normal flight (§91.303).

d. Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

e. The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights. Strobe/anti-collision lights shall be illuminated at all times.



f. The UA must operate an altitude encoding transponder (Mode S) in accordance with applicable guidelines and procedures.

g. The chase aircraft transponder must be on standby while performing chase operation flight with the UA. In the event of UA transponder failure, the chase aircraft will contact ATC and assume transponder operations.

h. In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

i. GA-ASI must request Notice to Airman (NOTAM) issuance through the appropriate Automated Flight Service twenty-four (24) hours prior to plan operation.

## **7. FLIGHT TERMINATION & LOST LINK PROCEDURES**

a. In accordance with GA-ASI Program Letter, dated June 30, 2006, flight operations must be terminated at any point when the approved containment area(s) is breached and/or control of the UA is questionable. If it is determined that the UA is still under the control of the PIC the UA shall return to base.

b. In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the primary containment area. The UAS PIC will immediately notify ATC, chase aircraft/observer of the loss of link condition and what the expected UA response will be.

## **8. MAINTENANCE**

a. This UAS must not be operated unless it is inspected and maintained in accordance with the General Atomics Inspection and Maintenance Program. Each inspection must be recorded in the UAS maintenance records.

b. No person must operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with, FAA-approved, General Atomics Inspection and Maintenance Program, and was found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records.

c. Only those individuals authorized by General Atomics, and acceptable to the FAA, may perform inspections required by these operating limitations.

d. Inspections of the UAS must be recorded in the UAS maintenance records showing the following, or a similarly worded, statement: "I certify that this UAS has been inspected on [insert date] in accordance with the scope and detail of the General Atomics Inspection and Maintenance Program, and was found to be in a condition for safe operation." The entry will





include the UAS's total time-in-service, and the name and signature of the person performing the inspection.

e. UAS instruments and equipment installed must be inspected and maintained in accordance with the requirements of the General Atomics Inspection and Maintenance Program. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

f. No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with 14 CFR §91.411 and §91.413 respectively. These inspections will be recorded in the UA maintenance records.

## **9. EQUIPAGE**

The UA shall be equipped with an operable transponder with Mode-S and two-way communications equipment allowing communications between the UAS pilot, chase aircraft, and ATC facilities.

## **10. INFORMATION REPORTING**

General Atomics shall provide the following information to [Kenneth.d.davis@faa.gov](mailto:Kenneth.d.davis@faa.gov) on a monthly basis.

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software), if any.
- d. Deviations from ATC instructions.

## **11. REVISIONS**

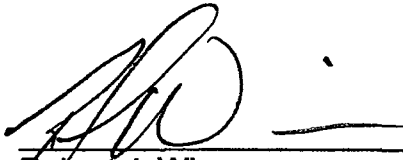
a. The experimental certificate, General Atomics FAA-accepted program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles MIDO, and coordinated with the Production and Airworthiness Division, AIR-200. AIR-200 will be responsible for headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic, Office of Chief Council, and Office of Rulemaking.

b. No Certificate of Authorization or Waiver may be issued in association with this Experimental Certificate unless coordinated with the Los Angeles MIDO and the Production and Airworthiness Division, AIR-200.

c. The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.



d. All revisions to GA-ASI FAA-approved Inspection and Maintenance Program must be reviewed and approved by the Van Nuys Flight Standards District Office.



Robert J. Winn  
Aviation Safety Inspector (Mfg.)  
Los Angeles-Manufacturing Inspection District Office  
3690 Paramount Blvd.  
Lakewood, CA 90712

Date: August 22, 2006

**I certify that I have read and understand the operating limitations, and conditions, that are a part of the Special Airworthiness Certificate, FAA Form 8130-7 issued August 22, 2006, for the purpose of Research and Development, Crew Training, or Market Survey.**

**This Airworthiness Certificate is issued for General Atomics UA model "ALTAIR UPB97010-1", serial number AA001, registration number N8172V.**

**Note: If the so stated limitations or conditions cannot be complied with, Altair flight operations shall be terminated.**



Applicant (signature)

Date: August 22, 2006

**Name (Printed): Gary L. Bender**

**Title: Director of Flight Operations Facilities**

**Company: General Atomics ASI**

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# APPLICATION FOR AIRWORTHINESS CERTIFICATE

**INSTRUCTIONS** — Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use an attachment. For special flight permits, complete Sections II and VI or VII as applicable.

I. AIRCRAFT DESCRIPTION	1. REGISTRATION MARK <b>N8172V</b>	2. AIRCRAFT BUILDER'S NAME (Make) <b>GENERAL ATOMICS Aeronautical Sys</b>	3. AIRCRAFT MODEL DESIGNATION <b>Altair-UPB97010-1</b>	4. YR. MFR. <b>2003</b>	FAA CODING <b>0610002</b>
	5. AIRCRAFT SERIAL NO. <b>AA001</b>	6. ENGINE BUILDER'S NAME (Make) <b>HONEYWELL</b>	7. ENGINE MODEL DESIGNATION <b>TPE331-10T</b>	33909	
	8. NUMBER OF ENGINES <b>1</b>	9. PROPELLER BUILDER'S NAME (Make) <b>McCAULEY</b>	10. PROPELLER MODEL DESIGNATION <b>X3GFR36C606</b>	11. AIRCRAFT IS (Check if applicable) <input checked="" type="checkbox"/> IMPORT	
	APPLICATION IS HEREBY MADE FOR: (Check applicable items) <input checked="" type="checkbox"/> A 1 STANDARD AIRWORTHINESS CERTIFICATE (Indicate category) <input type="checkbox"/> NORMAL <input type="checkbox"/> UTILITY <input type="checkbox"/> ACROBATIC <input type="checkbox"/> TRANSPORT <input type="checkbox"/> GLIDER <input type="checkbox"/> BALLOON <input checked="" type="checkbox"/> B SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items) 2 LIMITED 5 PROVISIONAL (Indicate class) 3 RESTRICTED (Indicate operation(s) to be conducted) 4 <input checked="" type="checkbox"/> EXPERIMENTAL (Indicate operation(s) to be conducted) 8 SPECIAL FLIGHT PERMIT (Indicate operation to be conducted, then complete Section VI or VII as applicable on reverse side) 1 CLASS I 2 CLASS II 1 AGRICULTURE AND PEST CONTROL 2 AERIAL SURVEYING 3 AERIAL ADVERTISING 4 FOREST (Wildlife conservation) 5 PATROLLING 6 WEATHER CONTROL 7 CARRIAGE OF CARGO 0 OTHER (Specify) 1 <input checked="" type="checkbox"/> RESEARCH AND DEVELOPMENT 2 AMATEUR BUILT 3 EXHIBITION 4 RACING 5 <input checked="" type="checkbox"/> CREW TRAINING <input checked="" type="checkbox"/> MKT. SURVEY 0 TO SHOW COMPLIANCE WITH FAR 1 FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE OR STORAGE 2 EVACUATE FROM AREA OF IMPENDING DANGER 3 OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT 4 DELIVERING OR EXPORT 5 PRODUCTION FLIGHT TESTING 6 CUSTOMER DEMONSTRATION FLIGHTS				
II. CERTIFICATION REQUESTED	C 6 <input checked="" type="checkbox"/> MULTIPLE AIRWORTHINESS CERTIFICATE (Check ABOVE "Restricted Operation" and "Standard" or "Limited," as applicable.)				
	A. REGISTERED OWNER (As shown on certificate of aircraft registration) IF DEALER, CHECK HERE <input type="checkbox"/> NAME <b>GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.</b> ADDRESS <b>16761 VIA DEL CAMPO COURT</b> <b>(ATTN: S. DANN)</b> <b>SAN DIEGO, CA 92127-1713</b>				
	B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated) <b>N/A</b> <input checked="" type="checkbox"/> AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.) <b>EXPERIMENTAL-000 N/A</b> AIRWORTHINESS DIRECTIVES (Check if all applicable AD's complied with and give latest AD No.) <b>2005-16 August 8, 2005</b> <input type="checkbox"/> AIRCRAFT LISTING (Give page number(s)) <b>N/A</b> SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated) <b>N/A</b>				
	C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS <input checked="" type="checkbox"/> CHECK IF RECORDS IN COMPLIANCE WITH FAR 91.417 <b>91.417</b> TOTAL AIRFRAME HOURS <b>300.6</b> 3 EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed) <b>0</b>				
III. OWNER'S CERTIFICATION	D. CERTIFICATION — I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Section 501 of the Federal Aviation Act of 1958, and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.				
	DATE OF APPLICATION <b>25 MAY 2005</b>		NAME AND TITLE (Print or type) <b>R. SCOTT DANN Program Manager</b>		SIGNATURE 
	A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete this section only if FAR 21.183(d) applies) 2 FAR PART 121 or 127 CERTIFICATE HOLDER (Give Certificate No.) 3 CERTIFICATED MECHANIC (Give Certificate No.) 6 CERTIFICATED REPAIR STATION (Give Certificate No.) AIRCRAFT MANUFACTURER (Give name of firm) <input checked="" type="checkbox"/> <b>GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.</b>				
	DATE <b>25 MAY 2005</b>		TITLE <b>PROGRAM MANAGER</b>		SIGNATURE 
IV. INSPECTION AGENCY CERTIFICATION	(Check ALL applicable blocks in items A and B) A. I find that the aircraft described in Section I or VII meets requirements for: <input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED <input type="checkbox"/> AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE				
	B. Inspection for a special flight permit under Section VII was conducted by: <input checked="" type="checkbox"/> FAA INSPECTOR <input type="checkbox"/> FAA DESIGNEE CERTIFICATE HOLDER UNDER: FAR 65 FAR 121, 127 or 135 FAR 145				
	DATE <b>August 25, 2005</b>	DISTRICT OFFICE <b>ANM-108L</b>	DESIGNEE'S SIGNATURE AND NO. <b>4</b>		FAA INSPECTOR'S SIGNATURE  <b>Alfonso D Ontiveros</b>
	V. FAA REPRESENTATIVE CERTIFICATION DATE <b>August 25, 2005</b> DISTRICT OFFICE <b>ANM-108L</b> DESIGNEE'S SIGNATURE AND NO. <b>4</b> FAA INSPECTOR'S SIGNATURE <b>1</b>				

<b>VI. PRODUCTION FLIGHT TESTING</b>	<b>A. MANUFACTURER</b>			
	NAME		ADDRESS	
	<b>B. PRODUCTION BASIS</b> (Check applicable item)			
	<input type="checkbox"/> PRODUCTION CERTIFICATE (Give production certificate number) <input type="checkbox"/> TYPE CERTIFICATE ONLY <input type="checkbox"/> APPROVED PRODUCTION INSPECTION SYSTEM			
<b>C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS</b> <span style="float:right">—————→</span>				
DATE OF APPLICATION		NAME AND TITLE (Print or type)		SIGNATURE
<b>VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST</b>	<b>A. DESCRIPTION OF AIRCRAFT</b>			
	REGISTERED OWNER		ADDRESS	
	BUILDER (Make)		MODEL	
	SERIAL NUMBER		REGISTRATION MARK	
	<b>B. DESCRIPTION OF FLIGHT</b> <span style="float:right">CUSTOMER DEMONSTRATION FLIGHTS <input type="checkbox"/> (Check if applicable)</span>			
	FROM		TO	
	VIA		DEPARTURE DATE	DURATION
	<b>C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT</b>			
	<input type="checkbox"/> PILOT	<input type="checkbox"/> CO-PILOT	<input type="checkbox"/> NAVIGATOR	<input type="checkbox"/> OTHER (Specify)
	<b>D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:</b>			
	<b>E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION</b> (Use attachment if necessary)			
<b>F. CERTIFICATION</b> — I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Section 501 of the Federal Aviation Act of 1958, and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is airworthy for the flight described.				
DATE		NAME AND TITLE (Print or type)		SIGNATURE
<b>VIII. AIRWORTHINESS DOCUMENTATION</b> (FAA use only)	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance with FAR 91.319 <del>§ 45.140</del> as Applicable		G. Statement of Conformity, FAA Form 8130-9 (Attach when required)
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft (Attach when required)
	<input checked="" type="checkbox"/>	C. Data, Drawings, Photographs, etc. (Attach when required)		I. Previous Airworthiness Certificate Issued in Accordance with
	<input checked="" type="checkbox"/>	D. Current Weight and Balance Information Available in Aircraft		FAR _____ CAR _____ (Original Attached)
	<input checked="" type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 (Attach when required)		J. Current Airworthiness Certificate Issued in Accordance with
	<input checked="" type="checkbox"/>	F. This Inspection Recorded in Aircraft Records		FAR <del>21.193 &amp; 21.195</del> 21.191 (a)(2)(f) (Copy attached)

UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION  
**SPECIAL AIRWORTHINESS CERTIFICATE**

A	CATEGORY/DESIGNATION <b>EXPERIMENTAL (UNMANNED AIRCRAFT)</b>	
	PURPOSE <b>Research &amp; Development, Crew Training or Market Survey</b>	
B	MANUFACTURER	NAME <b>N/A</b>
		ADDRESS <b>N/A</b>
C	FLIGHT	FROM <b>N/A</b>
		TO <b>N/A</b>
D	N- <b>8172V</b>	SERIAL NO. <b>AA001</b>
	BUILDER <b>General Atomics ASI</b>	MODEL <b>AI/TAIR UPB97010-1</b>
E	DATE OF ISSUANCE <b>08-25-05</b>	EXPIRY <b>08-25-06</b>
	OPERATING LIMITATIONS DATED <b>08-25-05</b> ARE A PART OF THIS CERTIFICATE	
	SIGNATURE OF FAA REPRESENTATIVE <i>Alfonso D. Ontiveros</i> <b>Alfonso D. Ontiveros</b>	DESIGNATION OR OFFICE NO. <b>ANM-108L</b>

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

A	This airworthiness certificate is issued under the authority of the Federal Aviation Act of 1958 and the Federal Aviation Regulations (FAR).
B	This airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire; and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable FAR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable FAR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in FAR Part 21, Section 21.181 or 21.217.





U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

800 Independence Ave, S.W.  
Washington, D.C. 20591

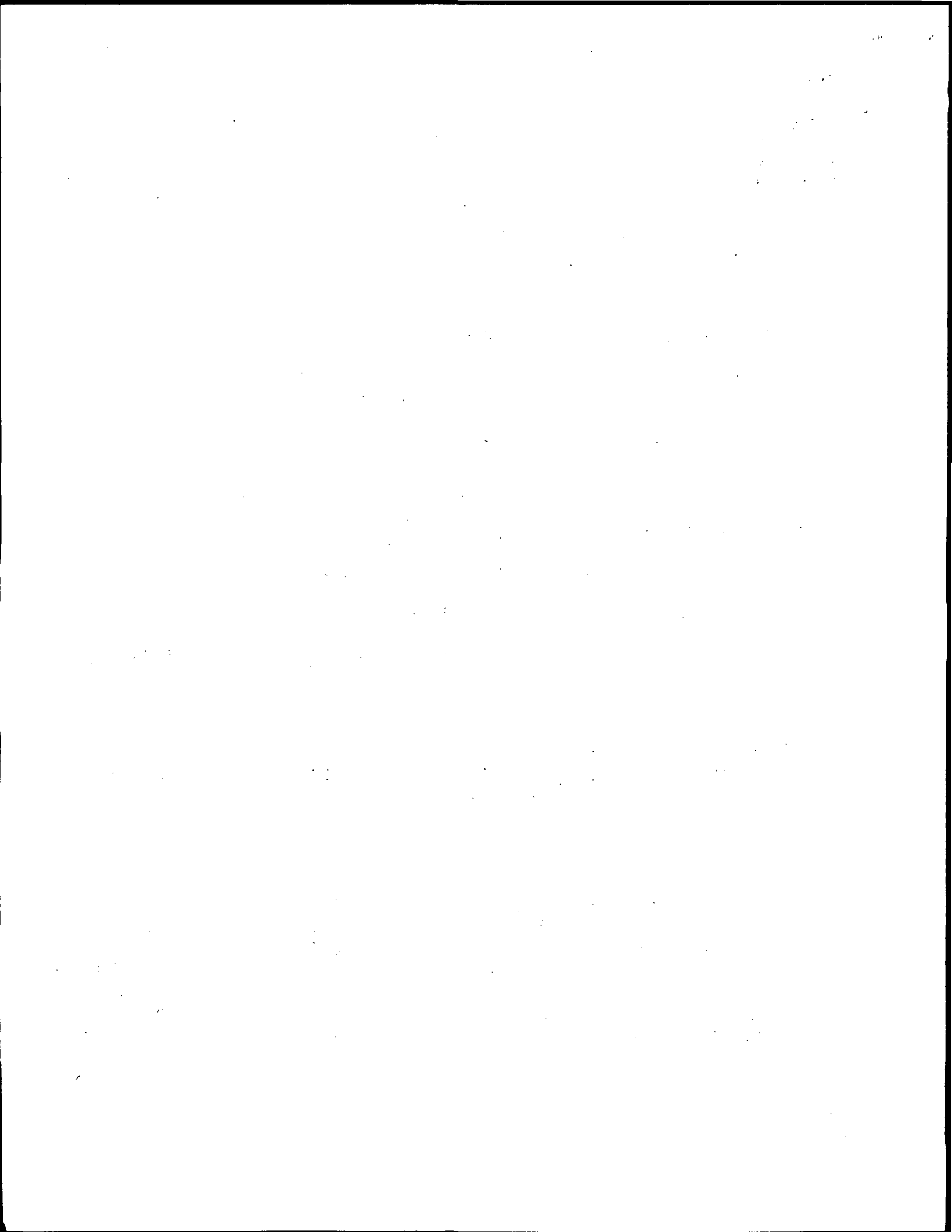
**EXPERIMENTAL - OPERATING LIMITATIONS**  
**RESEARCH AND DEVELOPMENT, CREW TRAINING, or MARKET SURVEY**

<b>REGISTERED OWNER NAME:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC. (GA-ASI)  <b>REGISTERED OWNER ADDRESS:</b>  16761 VIA DEL CAMPO CT SAN DIEGO, CA 92127  <b>AIRCRAFT DESCRIPTION:</b>  FIXED WING, TURBO PROP  <b>AIRCRAFT REGISTRATION:</b>  N8172V	<b>AIRCRAFT BUILDER:</b>  GENERAL ATOMICS AERONAUTICAL SYSTEMS  <b>YEAR MANUFACTURED:</b>  2003  <b>AIRCRAFT SERIAL NUMBER:</b>  AA001  <b>AIRCRAFT MODEL DESIGNATION:</b>  ALTAIR UPB97010-1  <b>ENGINE MODEL:</b> Honeywell TPE-331T  <b>PROPELLER MODEL:</b> McCauley 3-Bladed
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**The following conditions and limitations apply to all General Atomics Aeronautical Systems Inc (GA-ASI) Altair flight operations while operating in the National Airspace System (NAS):**

**1. GENERAL**

a. For the purposes of this **Special Airworthiness Certificate and limitations**, the Altair Unmanned Aircraft System (UAS), owned and operated by GA-ASI, is considered to be an integrated system that is composed of the Altair aircraft, S/N: AA001, unmanned aircraft (UA) pilot, UA control station(s) (fixed or mobile), telemetry, navigation and communications equipment to include ground, air, and space based equipment that is used for control of the Altair UA. The UAS also includes equipment on the ground and in the air that is used for communication with the chase aircraft and FAA Air Traffic Control.



- b.** Unless otherwise specified in this document, the Pilot-in-Command (PIC) and GA-ASI shall comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91. Alternative methods of compliance with specific regulations shall be annotated in this document as required.
- c.** No person may operate this UA for other than the purpose of R&D, crew training, or market surveys, to accomplish the flight operation outlined in GA-ASI Program Letter dated August 23, 2005, which describes compliance with §21.193(d), and has been made available to the pilot in command of the UA. In addition, this UA must be operated in accordance with applicable air traffic and general operating rules of part 91, and all additional limitations herein prescribed under the provisions of §91.319(e).
- d.** The PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the intended purpose of the flight.
- e.** No person may operate this UA to carry property for compensation or hire.
- f.** This UA must be marked with its U.S. Registration number in accordance with 14 CFR part 45.
- g.** This UA must display the word "EXPERIMENTAL" in accordance with §45.23(b).
- h.** Prior to conducting the initial Altair flight operations, General Atomics Aeronautical Systems, Inc. must forward a copy of the Altair's Program Letter, Special Airworthiness Certificate, and Operating Limitations to the FAA Western Terminal Service Area, Debra Trindle, Airspace Specialist, at [debra.trindle@faa.gov](mailto:debra.trindle@faa.gov) or via fax at 310-725-6826, Airspace Branch, AWP-520.
- i.** Section 47.45 requires that the FAA Aircraft Registry must be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by submitting Form 8050-1 to AFS-750 in Oklahoma City, Oklahoma.

## **2. PROGRAM LETTER**

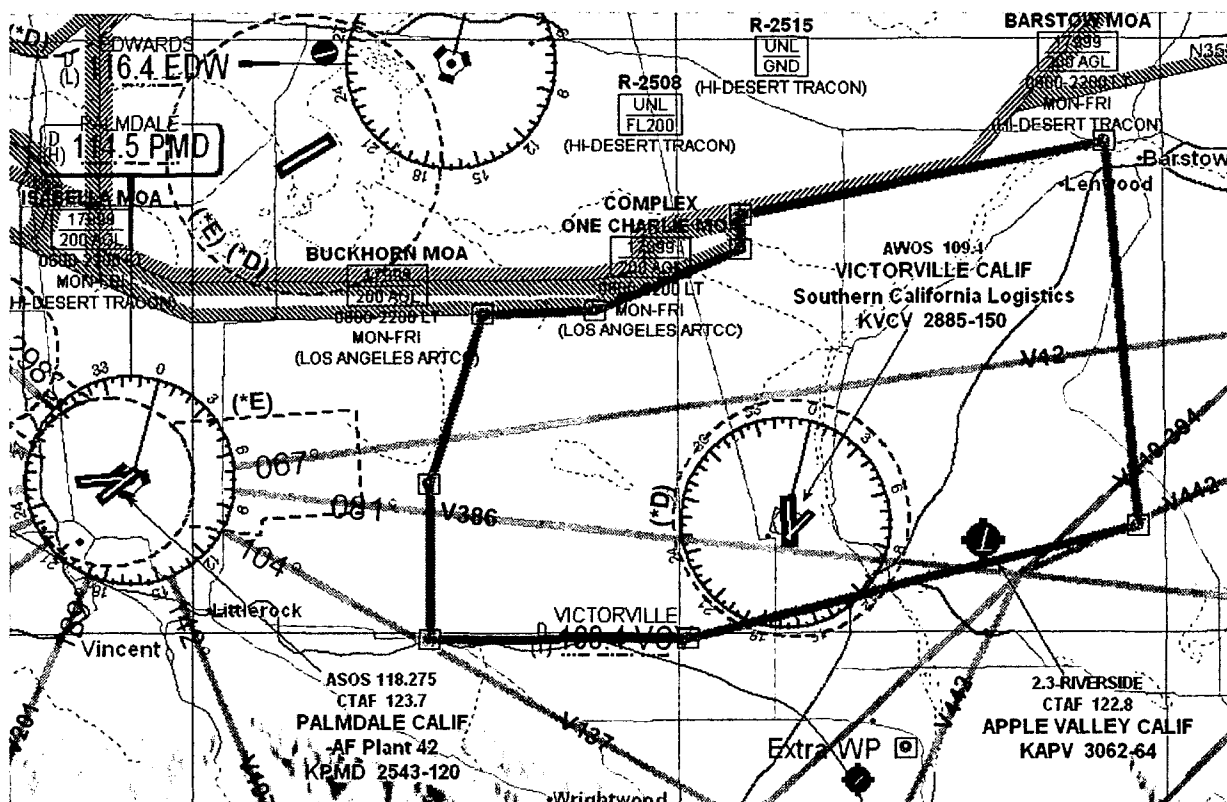
The GA-ASI's Altair research and development Program Letter, dated August 23, 2005, shall be used as a basis for the determination of the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.



### **3. AUTHORIZED FLIGHT OPERATIONS AREA**

- a. The base of operations for the UA shall be Gray Butte Field, Palmdale, CA and El Mirage Field, Adelanto, CA.
- b. All flight operations shall be conducted under Visual Flight Rules (VFR). The flight operations area authorized for the UA is depicted graphically below. This area shall be referred to as the "Primary Containment Area". It is recognized that General Atomics may be permitted to operate within Special Use Airspace (SUA) per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of the SUA (e.g. spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the Primary Containment Area. In these circumstances, General Atomics is responsible for notifying the FAA of the breach of any operations.
- c. Flight operations in the Primary Containment Area shall be conducted at or below 13,000 feet MSL within the boundaries defined below. Flight operations shall not be conducted within the Victorville (KVCV) Class D airspace. When operating in a terminal environment, the UA must have line of sight communications.
- d. Beginning at:
  - lat. 34°29'47"N, long. 117°45'23"W, to
  - lat. 34°37'41"N, long. 117°45'23"W, to
  - lat. 34°46'21"N, long. 117°42'00"W, to
  - lat. 34°46'30"N, long. 117°35'03"W, to
  - lat. 34°49'30"N, long. 117°26'03"W, to
  - lat. 34°51'17"N, long. 117°26'03"W, to
  - lat. 34°54'50"N, long. 117°03'30"W, to
  - lat. 34°35'22"N, long. 117°01'38"W, to
  - lat. 34°29'50"N, long. 117°29'25"W, thence to the point of beginning.





**e. The PIC shall ensure that all UA flight operations remain within the lateral and vertical boundaries of the Primary Containment Area or any SUA approved by the using agency. Furthermore, the PIC shall take into account all factors that may affect the capability of remaining within the containment areas. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.**

**f. Any flight operation that transgresses the lateral or vertical boundaries of the Primary Containment Area or any SUA shall be immediately terminated, and Air Traffic Control immediately notified of the flight status. GA-ASI shall, at the conclusion of the flight, immediately notify the Manager of the Flight Technology Requirements Branch (AFS-430) of any flight operation that transgresses the lateral or vertical boundaries of the Primary Containment Areas or any SUA. AFS-430 can be reached at telephone number 202-385-4622, or by fax at 202-385-4653.**

**g. Further flight operations shall not be conducted until the incident is reviewed by AFS-430, and authorization to resume operations is received.**





#### **4. UA PILOT AND OBSERVER**

- a. All flight operations conducted in the Primary Containment Area shall have an observer to perform traffic avoidance and visual observation to fulfill the "see and avoid" requirement of §91.113.**
- b. UA pilots shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, Airplane category with Single or Multiengine class ratings, or military equivalent, and have it in their possession.**
- c. All observers shall:**
  - 1. Hold at a minimum, an FAA Private Pilot certificate or military equivalent, or**
  - 2. Successfully completed specific observer training acceptable to the FAA.**
- d. UA pilots shall maintain currency in manned airplanes per §61.57.**
- e. UA pilots shall maintain currency in unmanned aircraft in accordance with GA-ASI company procedures.**
- f. UA pilots shall have a Flight Review in manned aircraft every 24 calendar months per §61.56.**
- g. UA pilots shall have a Flight Review in unmanned aircraft every 24 calendar months in accordance with GA-ASI company procedures.**
- h. Pilots and Observers shall have successfully completed applicable manufacturer training for all components of the UAS.**
- i. Pilots and observers must have in their possession a valid third class (or higher) airman medical certificate that has been issued under 14 CFR part 67.**
- j. A PIC must be designated at all times and responsible for the safety of the UA and persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground. The PIC shall avoid densely populated areas (14 CFR § 91.319) and exercise increased vigilance when operating within published airway boundaries.**
- k. UA pilots and observers shall perform crew duties for only one UA at a time. When the observer is located in a chase aircraft, the observer's duties shall be dedicated to the task of observation only, concurrent duty as pilot is not authorized.**
- l. All observers must be thoroughly trained, familiar with, and possess, operational experience with the equipment being utilized for observation and detection of other aircraft for collision avoidance purposes as outlined in GA-ASI program letter.**



**m. Visual Observer Responsibilities:** The task of the observer is to provide the pilot of the UA with instructions to maneuver the UA clear of any potential collision with other traffic. Visual observer duties require continuous visual contact with the UA at all times in such a manner as to be able to discern UA attitude and trajectory. At no time shall the visual observer permit the UA to operate beyond line-of-sight necessary to ensure that maneuvering information can be reliably determined. At no time shall visual observers conduct their duties more than three statute miles laterally or 3000 feet vertically from the UA. Observers must maintain continuous visual contact with the UA. When a chase aircraft is utilized, it must maintain a reasonable proximity, and shall position itself relative to the UA in such a manner to reduce the hazard of collision per §91.111.

## **5. COMMUNICATIONS**

- a.** Each UAS Flight operation must be coordinated by telephone with High Desert TRACON and receive a transponder code at (661) 277-3843, at least 2 hours prior to the start of the flight operation
- b.** Upon initial contact with ATC, the PIC must indicate the experimental nature in accordance with 14 CFR § 91.319.
- c.** The PIC must maintain two-way communication with ATC. If a chase aircraft is utilized, the chase aircraft pilot shall maintain two-way communications with ATC and with the PIC.
- d.** The PIC and observer(s) must maintain two-way communications with each other during all operations.
- e.** If communications cannot be maintained between the PIC, chase aircraft pilot, observer(s) and appropriate ATC facility, the UA will squawk 7600-transponder code, expeditiously return to its base of operations while remaining within the containment area, and conclude the flight operation.
- f.** Spectrum used for operation and control of the UA must be approved by the FCC or other appropriate government oversight agency prior to operations being conducted.



## **6. FLIGHT CONDITIONS**

- a.** All flight operations must be conducted in visual meteorological conditions (VMC), including cloud clearance minimums as specified in 14 CFR § 91.155. Flight operation in instrument meteorological conditions (IMC) is not permitted.
- b.** The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA's attitude, an abnormal acceleration, or other flight action not necessary for normal flight (§91.303).
- c.** Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.
- d.** The UA and chase aircraft shall be equipped with operable navigation, position, and strobe/anti-collision lights. Strobe/anti-collision lights shall be illuminated at all times.
- e.** The UA must operate an altitude encoding transponder (Mode C) in accordance with applicable guidelines and procedures.
- f.** The chase aircraft transponder must be on standby while performing chase operation flight with the UA. In the event of UA transponder failure, the chase aircraft will contact ATC and assume transponder operations.
- g.** In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.
- h.** GA-ASI must request Notice to Airman (NOTAM) issuance through the Riverside Automated Flight Service twenty-four (24) hours prior to plan operation.

## **7. FLIGHT TERMINATION & LOST LINK PROCEDURES**

- a.** In accordance with GA-ASI Program Letter, dated August 23, 2005, flight termination must be initiated at any point that operation within the approved flight area(s) is breached and the control of the UA is questionable.
- b.** In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the primary containment area. The UA Pilot will immediately notify ATC, chase aircraft/observer of the loss of link condition and what the expected UA response will be.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in all financial dealings.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

3. The third part of the document presents the results of the study. It includes a series of tables and graphs that illustrate the findings of the research. The data shows a clear trend of increasing activity over time.

4. The fourth part of the document discusses the implications of the findings. It suggests that the results have significant implications for the field of study and may lead to further research in this area.

5. The fifth part of the document concludes the study. It summarizes the main findings and provides a final statement on the importance of the research.

## **8. MAINTENANCE**

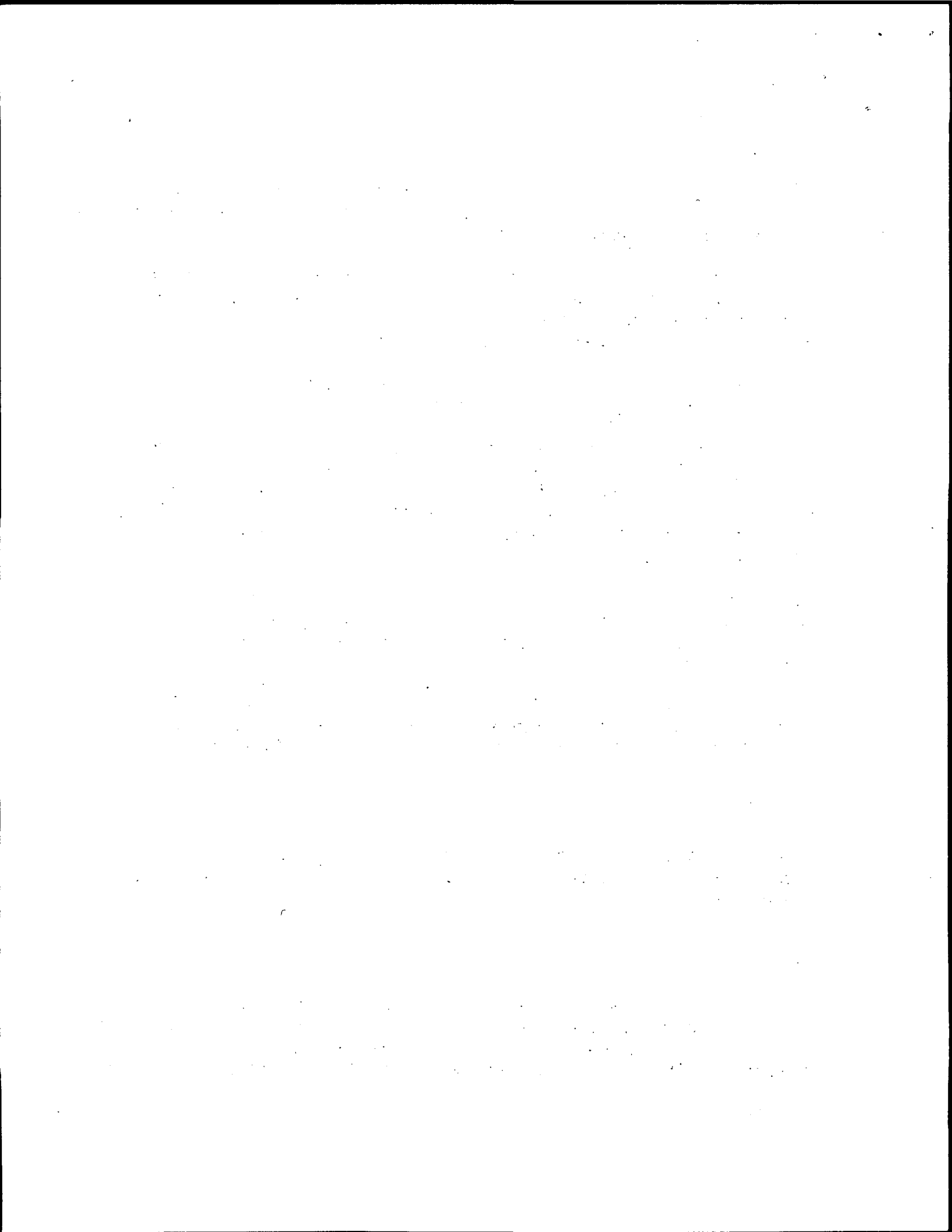
- a. This UA must not be operated unless it is inspected and maintained in accordance with the General Atomics Inspection and Maintenance Program. Each inspection must be recorded in the UA maintenance records.
- b. No person must operate this UA unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with, FAA-approved, General Atomics Inspection and Maintenance Program, and was found to be in a condition for safe operation. This inspection will be recorded in the UA maintenance records.
- c. Only those individuals authorized by General Atomics, and acceptable to the FAA, may perform inspections required by these operating limitations.
- d. Inspections of the UA must be recorded in the UA maintenance records showing the following, or a similarly worded, statement: "I certify that this UA has been inspected on [insert date] in accordance with the scope and detail of the General Atomics Inspection and Maintenance Program, and was found to be in a condition for safe operation." The entry will include the UA's total time-in-service, and the name and signature of the person performing the inspection.
- e. UA instruments and equipment installed must be inspected and maintained in accordance with the requirements of the General Atomics Inspection and Maintenance Program. Any maintenance or inspection of this equipment must be recorded in the UA maintenance records.
- f. No person may operate this UA unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with 14 CFR §91.411 and §91.413 respectively. These inspections will be recorded in the UA maintenance records.

## **9. EQUIPPAGE**

The UA shall be equipped with an operable transponder with Mode-C and two-way communications equipment allowing communications between the UA pilot, chase aircraft, and ATC facilities.

## **10. REVISIONS**

- a. The experimental certificate, General Atomics FAA-accepted program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Los Angeles MIDO, and coordinated with the Production and Airworthiness Division, AIR-200. AIR-200 will be responsible for headquarters internal coordination with





the Aircraft Certification Service, Flight Standards Service, Air Traffic, Office of Chief Council, and Office of Rulemaking.

b. No Certificate of Authorization or Waiver may be issued in association with this Experimental Certificate unless coordinated with the Los Angeles MIDO and the Production and Airworthiness Division, AIR-200.

c. The provisions and limitations annotated in this operational approval may be amended or canceled at any time as deemed necessary by the FAA.

d. All revisions to GA-ASI FAA-Approved Inspection and Maintenance Program must be reviewed and approved by the Van Nuys Flight Standards District Office.



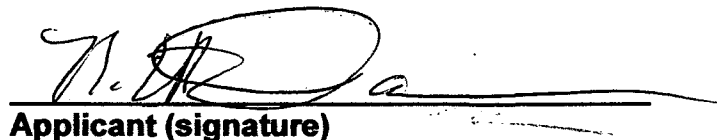
Alfonso D. Ontiveros  
Los Angeles Manufacturing Inspection District Office  
3690 Paramount Blvd.  
Lakewood, CA 90712

Date: August 25, 2005

I certify that I have read and understand the operating limitations, and conditions, that are a part of the Special Airworthiness Certificate, FAA Form 8130-7 issued August 25, 2005, for the purpose of Research and Development, Crew Training, or Market Survey.

This Airworthiness Certificate is issued for General Atomics UA model "ALTAIR UPB97010-1", serial number AA001, registration number N8172V.

Note: If the so stated limitations or conditions cannot be complied with, Altair flight operations shall be terminated.



Applicant (signature)

Date: August 25, 2005

Name (Printed): Robert Scott Dann

Title: Manager Domestic Program

Company: General Atomics ASI



Exemption No. 8607

UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
WASHINGTON, DC 20591

In the matter of the petition of

**GENERAL ATOMICS AERONAUTICAL  
SYSTEMS, INC.**

for an exemption from § 91.9 (b)(2) and  
§ 91.203 (a) and (b) of Title 14, Code of  
Federal Regulations

**Regulatory Docket No.  
FAA-2005-22166**

**GRANT OF EXEMPTION**

On August 17, 2005, Mr. R. Scott Dann, Manager Domestic Programs, Inc., General Atomics Aeronautical Systems, (GAAS), 16761 Via Del Campo Court, San Diego, CA 92127 petitioned the Federal Aviation Administration (FAA) on behalf of GAAS for an exemption from §§ 91.9(b)(2) and 91.203(a) and (b) of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would allow GAAS to operate unmanned aircraft systems (UASs) that do not carry and display the aircraft airworthiness, certification, and registration documents required in Part 91.

**The petitioner requests relief from the following regulations:**

Section 91.9(b)(1), and (b)(2), prescribes, in pertinent part, that for Civil aircraft flight manual, marking, and placard requirements,

(b) No person may operate a U.S.-registered civil aircraft—

(2) For which an Airplane or Rotorcraft Flight Manual is not required by §21.5 of this chapter, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination thereof.

Section 91.203(a)(1) prescribes, in pertinent part, that civil aircraft require the following certifications:

AFS-05-480-E



(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:

(1) An appropriate and current airworthiness certificate.

(2) An effective U.S. registration certificate issued to its owner.

(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

**The petitioner supports its request with the following information:**

The petitioner will be operating UASs in the United States on missions related to UAS research and development, crew training, market surveys and to support the war on terrorism.

The operations proposed by GAAS meet an equivalent level of safety because GAAS uses an established Quality System for engineering, production, delivery, servicing, and ground/flight operations of its UASs. The operations are in the public interest because GAAS' operations support military and civilian customers involved in the war on terrorism in the United States and in other countries.

Requiring these unmanned aircraft (UA) to carry and display documents onboard is unnecessary because the aircraft operate without passengers or crew, for whom the carrying and display of those documents is intended.

A summary of the petition was displayed at the Office of the Federal Register on August 16, 2005 and was published in the Federal Register on August 22, 2005 (70 FR 49009). No comments have been received.

**The FAA's analysis is as follows:**

The FAA has considered the petitioner's supporting information and has concluded that granting the relief requested would provide an equivalent level of safety to that intended by the rule and is in the public interest.

We agree with the petitioner that it is unnecessary to carry and display the airworthiness, certification, and registration documents in UASs for the operations described. The original intent of the subject regulation was to display the airworthiness and registration documents so they would be easily available to FAA inspectors and passengers for inspection and verification of the airworthiness and registration of the aircraft. The FAA requires aircraft to carry the flight manual so the pilot would have ready access to the aircraft limitations while in flight. In this case, the aircraft will always be operated without any passengers or crew.



The missions for which UASs are intended will prevent the aircraft from being available for the inspections normally prescribed for civil aircraft. Further, it will be operated on strictly confined missions from a known departure and arrival point, under the constant control of a pilot-in-command. We also find that requiring these special-use aircraft to carry superfluous paper documents may present a safety hazard to the integrity of the UA.

FAA operating limitations and special arrangements with Air Traffic Control (ATC) for surveillance of UA flights adequately compensate for the requirements for carrying airworthiness and registration documents. We find the intent of the regulation is better served by having the required documents in the control of the aircraft operator and available for inspection under the special conditions prescribed in this exemption.

#### **The FAA's Decision**

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, General Atomics Aeronautical Systems, Inc. is granted an exemption from 14 CFR § 91.9(b)(2), and § 91.203(a) and (b) to the extent necessary to allow GAAS to operate its UA without carrying the airworthiness and registration documents required by Part 91, subject to the conditions and limitations listed below.

#### **Conditions and Limitations**

1. The documents required by § 91.9 and 91.203 must be available to the pilot-in-command of the UAS any time the aircraft is operating. Those documents must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.

This exemption is valid indefinitely, unless sooner suspended or rescinded.

Issued in Washington, DC, on August 22, 2005.

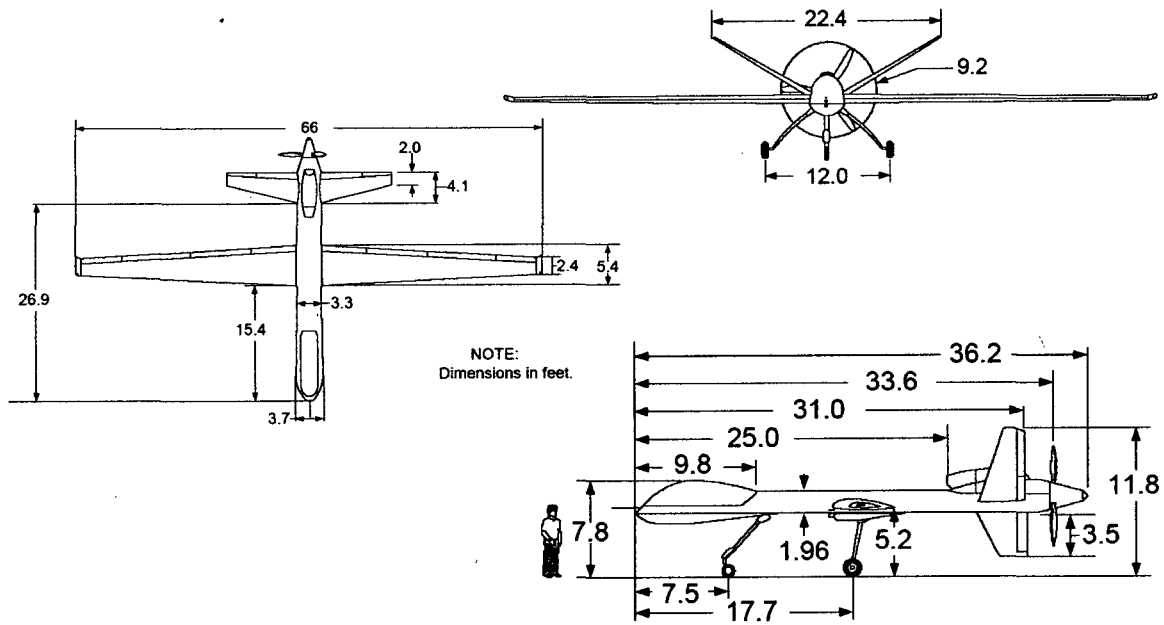
  
John M. Allen

Acting Director, Flight Standards Service





Program Letter Altair



Altair 3-View Drawing

Please direct all correspondence to:

R. Scott Dann  
General Atomics Aeronautical Systems, Inc.  
16761 Via Del Campo Court  
San Diego, CA 92127-1713  
(858) 455-4652

